

Naval Education and  
Training Command

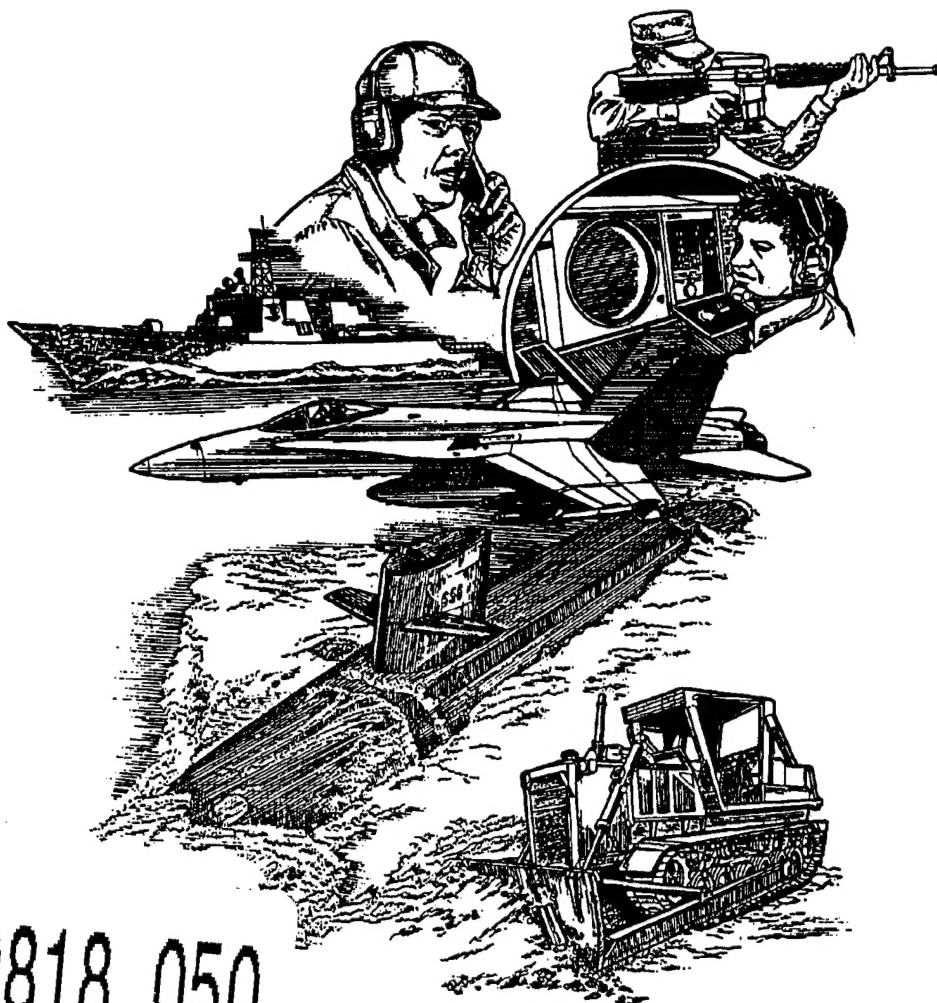
NAVEDTRA 131  
FEBRUARY 1993

Training Manual  
(TRAMAN)



# PERSONNEL PERFORMANCE PROFILE BASED CURRICULUM DEVELOPMENT MANUAL

## VOLUME II SAMPLE PRODUCTS



19950818 050

### SUPPLEMENT TO MIL-STD-1379D

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DEPARTMENT OF THE NAVY  
CHIEF OF NAVAL EDUCATION AND TRAINING  
NAVAL AIR STATION  
PENSACOLA, FLORIDA 32508-5100

1500  
Ser N-63/0076  
9 Mar 93

LETTER OF PROMULGATION FOR NAVEDTRA 131

1. This manual will be implemented throughout the Naval Education and Training Command upon receipt. It replaces DOD-HDBK 292 as a guide for Personnel Performance Profile (PPP) based curriculum development within the NAVEDTRACOM. This manual also supersedes and cancels NAVEDTRA 38004A.
2. This publication provides guidance for developing training materials which will comply with the requirements of MIL-STD 1379D, recognized by CNET as the single standard for production of training materials.
3. The procedures presented in this manual follow a PPP Based Curriculum Development method. The manual is designed for use by Navy subject matter experts who hold Instructor NEC 9502 or equivalent and are graduates of the PPP Based Curriculum Developer course (CIN A-012-0051), which used this manual as its basic reference.
4. Guidelines for planning a curriculum development project and for producing training materials through five stages of the PPP based method are contained in this manual. Guidelines for the implementation and evaluation of curriculum training materials are contained in NAVEDTRA 135, Navy School Management Manual, promulgated 18 September 1992.
5. Procedural guidance for development of training materials following a task based method is published in NAVEDTRA 130.
6. Corrections and comments concerning this manual are invited and should be addressed to Chief of Naval Education and Training (N-63).
7. Reviewed and approved.

*Louise C. Wilmot*  
LOUISE C. WILMOT  
VICE CNET

Subj: LETTER OF PROMULGATION FOR NAVEDTRA 131

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## CHANGE RECORD

[illegible]

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**TAB A**

**EXTERIOR COMMUNICATION SYSTEM SAMPLE PACKAGE**

**NAVEDTRA 131**  
**FEBRUARY 1993**

**TAB A-1**

**TRAINING PROJECT PLAN**

**A-1-1**

TRAINING PROJECT PLAN  
FOR  
TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)  
CONTROL, MONITOR, AND TEST SUBSYSTEM (CMT)  
MAINTENANCE  
A-111-4251

PREPARED FOR  
CHIEF OF NAVAL TECHNICAL TRAINING  
NAVAL AIR STATION MEMPHIS (75)  
MILLINGTON, TENNESSEE 38054-5056

PREPARED BY  
TRIDENT TRAINING FACILITY  
BANGOR, WASHINGTON 98315-5400

APRIL 90  
(APRIL 91)

**Example Training Project Plan Cover Page**

A-1-3

## TRAINING PROJECT PLAN

### TABLE OF CONTENTS

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## TRAINING PROJECT PLAN

### Justification for Course Revision

This Training Project Plan describes a course revision to support changes to the TRIDENT Exterior Communications System (ECS) Control Monitor and Test (CMT) Subsystem Maintenance course. The following establishes the need for the course revision.

1. Major revisions to the TRIDENT Radioman PPP/TPS approved by CNTECHTRA ltr 1500 Ser N214A/1331 dtd 8 Feb 91.
2. The combination of the TRIDENT (ECS) CMT System Maintenance (A-150-0228) course and the TRIDENT (ECS) Level III Replacement (A-101-0169) course.
3. Subject course contains numerous technical documentation, and curriculum format errors.

### Impact if Course is not Revised

Failure to revise the curriculum materials will result in a continuation of training which does not reflect the revised TRIDENT Radioman PPP/TPS and does not support fleet requirements.

Example Training Project Plan - Continued

## TRAINING PROJECT PLAN

### COURSE DATA

Course Title:

TRIDENT Exterior Communications System (ECS)  
Control Monitor and Test (CMT) Subsystem

Course Identification Number (CIN):

A-111-4251

CDP: 1234

Course Status:

This is a revision to the 1976 course.

Course Mission Statement:

The TRIDENT (ECS) CMT Basic Maintenance course is designed to provide an RM1 the training necessary to document preventive and corrective maintenance on the TRIDENT ECS Control Monitor and Test (CMT) Subsystem and undocumented corrective maintenance on selected CMT Subsystem equipments, under all conditions of readiness, in port or underway.

Occupational Classification:

NEC 1234 is awarded to course graduates.

Prerequisites:

1. Rate: RM
2. Clearance: SECRET and CRYPTO NEED-TO-KNOW
3. Graduate of TRIDENT ECS Level I (A-101-0168) course, TRIDENT (ECS) Support Subsystem (A-101-0172) course, TRIDENT (ECS) ANT/AIS Subsystem (A-101-0173) course, TRIDENT (ECS) HF/UHF Subsystem (A-101-0175) course, TRIDENT (ECS) VLF/LF Subsystem (A-101-0170) course, and TRIDENT (ECS) DSS Subsystem (A-101-0171) course.

Course Overview:

Perform selected preventive and documented corrective maintenance on the TRIDENT ECS Control Monitor and Test (CMT) Subsystem to include:

- Indicator Processor ID-2156/BSC-1
- Antenna Deployment Indicator ID-2157/BSC-1
- Power Supply PP-7476/BSC-1
- Interface Unit J-3565/BSC-1 (Message Interface Unit)

Example Training Project Plan - Continued



## TRAINING PROJECT PLAN

### COURSE DATA (continued)

#### Course Overview

- Controller Memory Unit C-10448/BSC-1
- Interface Unit J-3566/BSC-1 (Digital Interface Unit)
- Switching Unit SA-2204/BSC-1 (Mass Memory 2 Interface Unit)
- Interface Unit J-3568/BSC-1 (HSP/Magnetic Tape Unit Interface Unit)
- Recorder-Reproducer Control C-10447/BSC-1
- Recorder-Reproducer Unit RD-442/BSC-1
- Comparator CM-507/BSC-1
- Disc Memory Unit MU-674/BSC-1

This course will also provide the training necessary to perform undocumented corrective maintenance on the following CMT Subsystem equipments:

- Interface Unit J-3565/BSC-1 (Message Interface Unit)
- Interface Unit J-3566/BSC-1 (Digital Interface Unit)
- Recorder-Reproducer Control C-10447/BSC-1
- Recorder-Reproducer Unit RD-442/BSC-1
- Controller Memory Unit C-10448/BSC-1
- Disc Memory Unit MU-674/BSC-1

The course lesson topic changes are as follows:

<u>Summary of Differences</u>	<u>Hours Increased</u>
4A13 Theory of the J-3566/BSC-1	7
4A13 Corrective Maintenance of the J-3566/BSC-1	12
4A10 Theory of the J-3565/BSC-1	6
4A10 Corrective Maintenance of the J-3565/BSC-1	12
4A17 Theory of the RD-442/BSC-1	7
4A17 Corrective Maintenance of the RD-442/BSC-1	12

#### Planned Course Length:

1. 72 Calendar Days
2. 45 Instructional Days

#### Current Course Length:

1. 52 Calendar Days
2. 38 Instructional Days

#### Training Sites:

1. TRIDENT Training Facility, Bangor, Silverdale, Washington
2. TRIDENT Training Facility, Kings Bay, Georgia

### Example Training Project Plan - Continued

**TRAINING PROJECT PLAN**  
**COURSE DATA (continued)**

<u>Number of Classes by Training Site:</u>	<u>Current:</u>	<u>Planned:</u>
1. TRIDENT Training Facility, Bangor	3	3
2. TRIDENT Training Facility, Kings Bay	3	3

<u>Class Capacity by Training Site:</u>	<u>Current:</u>	<u>Planned:</u>
1. TRIDENT Training Facility, Bangor		
a. Maximum:	12	12
b. Minimum:	8	8
2. TRIDENT Training Facility, Kings Bay		
a. Maximum:	12	12
b. Minimum:	8	8

<u>Planned Average On Board by Training Site:</u>	<u>Current:</u>	<u>Planned:</u>
1. TRIDENT Training Facility, Bangor	12	12
2. TRIDENT Training Facility, Kings Bay	12	12

Instructor/Support Manning by Training Site:

The estimated plan for instructor/support manning is based on the same ratios for all sites. Periods can be found on the Course Master Schedule.

	<u>Current:</u>	<u>Planned:</u>
1. TRIDENT Training Facility, Bangor	2	4
2. TRIDENT Training Facility, Kings Bay	2	4

**Example Training Project Plan - Continued**

## **TRAINING PROJECT PLAN**

### **SAFETY RISKS AND HAZARDOUS MATERIALS**

This course will be designated as high risk in accordance with CNETINST 1500.20. Special emphasis must be placed on strict compliance with published safety precautions and on personnel awareness of potentially hazardous conditions while performing maintenance on energized equipment. Strict adherence to approved and verified operating, emergency, and maintenance procedures is MANDATORY. As a minimum, each individual is responsible for knowing, understanding, and observing all applicable safety precautions.

### **CURRICULUM DEVELOPMENT METHOD**

1. Curriculum will be developed in accordance with NAVEDTRA 131. This method provides support and continuity with related training materials.
2. The documents that will be produced/revised for this course are:
  - a. Training Project Plan
  - b. Personal Performance Profiles
  - c. Training Path System
  - d. Training Course Control Document
  - e. Lesson Plan (3 Volumes)
  - f. Trainee Guide (1 Volume)
  - g. Test Package
  - h. Support Materials
3. The primary mode of instruction will be group paced consisting of lecture and seminar periods with practical/problem solving experiences. The trainees will be guided by the instructors during graded problem solving sessions to allow maximum acquisition of knowledge and skills.

**Example Training Project Plan - Continued**

## TRAINING PROJECT PLAN

### MILESTONE CHART

<u>Milestones</u>	<u>Completion Date</u>
1. Approval of Training Project Plan	27 April 91*
2. Develop/Revise Personnel Performance Profiles	15 May 91
3. Develop Training Path System	25 May 91
4. Submit Training Course Control Document	03 August 91
5. Approval of Training Course Control Document	07 September 91*
6. Develop Support Material	14 December 91
7. Request authorization to conduct pilot	14 December 91*
8. Conduct pilot (18 March - 10 May)	10 May 92
9. Submit pilot report and red line copy of course materials	21 June 92
10. Incorporate changes approved by CNTECHTRA	29 June 92
11. Issue Letter of Promulgation	29 July 92*
12. Print and distribute to training sites	23 August 92
13. Instructor certification/personalization complete	13 September 92
14. Implementation of training program	16 September 92

\* All follow on dates assume approval will be granted by this date.

Example Training Project Plan - Continued

# TRAINING PROJECT PLAN

A-111-4251

## RESOURCE REQUIREMENTS LIST

COURSE: TRIDENT Exterior Communications system (ECS)

CLASS SIZE: As per the Formal Schools Catalog

### I. Manpower

#### 1. TRIDENT Training Facility, Bangor

CPATS Document #: 91 68437 68437 C108A

Cost Account Code: 5PPQ

	<u>FY91</u>	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY95</u>
<b>Officer Billets Required</b>	1	1	1	1	1
Billets Authorized	1	1	1	1	1
Billets Compensated	0	0	0	0	0
Billets Available					
Delta	0	0	0	0	0
<b>Enlisted Billets Required</b>	4	4	4	4	4
Billets Authorized	2	2	2	2	2
Billets Compensated	0	0	0	0	0
Billets Available					
Delta	-2	-2	-2	-2	-2
<b>Civilian Billets Required</b>					
Billets Authorized	0	0	0	0	0
Billets Compensated	0	0	0	0	0
Billets Available					
Delta	0	0	0	0	0

#### 2. TRIDENT Training Facility, Kings Bay

CPATS Document #: 91 68701 68701 C108A

Cost Account Code: 5PPQ

	<u>FY91</u>	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY95</u>
<b>Officer Billets Required</b>	1	1	1	1	1
Billets Authorized	1	1	1	1	1
Billets Compensated	0	0	0	0	0
Billets Available					
Delta	0	0	0	0	0
<b>Enlisted Billets Required</b>	4	4	4	4	4
Billets Authorized	2	2	2	2	2
Billets Compensated	0	0	0	0	0
Billets Available					
Delta	-2	-2	-2	-2	-2
<b>Civilian Billets Required</b>					
Billets Authorized	0	0	0	0	0
Billets Compensated	0	0	0	0	0
Billets Available					
Delta	0	0	0	0	0

## RESOURCE REQUIREMENTS LIST (CONT'D)

II. Funding

## 1. TRIDENT Training Facility, Bangor

<u>Approp</u>	<u>AG/SAG</u>	<u>Expense</u>	<u>FY91</u>	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY95</u>
OMN	F3/FF						
OPN	F3/FF						

## 2. TRIDENT Training Facility, Kings Bay

<u>Approp</u>	<u>AG/SAG</u>	<u>Expense</u>	<u>FY91</u>	<u>FY92</u>	<u>FY93</u>	<u>FY94</u>	<u>FY95</u>
OMN	F3/FF						
OPN	F3/FF						

RESOURCE REQUIREMENTS LIST (CONT'D)

III. Training Materials

<u>Nomenclature/ Description</u>	<u>Quantity Req'd TRITRAFAC Bangor</u>	<u>Quantity Req'd TRITRAFAC Kings Bay</u>
A-111-4251 TRIDENT Exterior Communications Subsystem (ECS) Instructor Guide	10	10
A-111-4251 TRIDENT Exterior Communications Subsystem (ECS) Trainee Guide	10	10

IV. Publications

<u>Nomenclature/ Description</u>		
MIP/MRC C-668/001-30 Q12R	15	15
MIP/MRC C-668/001-30 Q17R	15	15
MIP/MRC C-668/001-30 Q18R	15	15

V. Audio/Visual Aids

<u>Nomenclature/ Description</u>		
Transparancies, A-111- 4251 series	1 set	1 set

VI. Training Equipment

<u>Nomenclature/ Description</u>		
AN/BSC-1 Trainer	1	1

**TAB A-2**

**PERSONNEL PERFORMANCE PROFILES**



**EQUIPMENT PPP TABLE  
EXAMPLES**

**PERSONNEL PERFORMANCE PROFILE  
FOR  
TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)  
SUPPORT SYSTEM**

**TABLE F0194  
POWER DISTRIBUTION GROUP  
1 AUGUST 1990**

**EQUIPMENT MODIFICATION RECORD**

**None**

**NEW DESIGN - DRAWING NUMBER**

**None**

**F0194-1/F0194-2**

**Example Equipment PPP Table Cover Page**

TABLE F0194. Power Distribution Group (Equipment).

ITEM NO.	KNOWLEDGE/SKILL
1.	<u>EQUIPMENT KNOWLEDGE</u>
1-1.	GENERAL
1-1-1.	State the functions of the Power Distribution Group.
1-1-2.	State that the Power Distribution Group consists of the following major functional areas. Include the function of each. <ul style="list-style-type: none"> <li>a. Power panel</li> <li>b. Power distribution black panel</li> <li>c. Power distribution red panel</li> <li>d. Component compartment</li> <li>e. Ground fault indicator panel</li> <li>f. Junction boxes</li> </ul>
1-1-3.	Define the abbreviations, terms, and symbols used with the Power Distribution Group.
1-1-4.	State the operational characteristics and capabilities of the Power Distribution Group.
1-1-5.	State the security requirements for the Power Distribution Group.
1-2.	PHYSICAL DESCRIPTION
1-2-1.	Describe all major and associated components of the Power Distribution Group. Include names, nomenclature, physical appearance, reference designators, locations, and construction features. <ul style="list-style-type: none"> <li>a. Power panel</li> <li>b. Power distribution black panel</li> <li>c. Power distribution red panel</li> <li>d. Component compartment</li> <li>e. Ground fault indicator panel</li> <li>f. Junction boxes</li> </ul>
1-2-2.	Describe the controls and indicators directly associated with the Power Distribution Group. Include names, reference designators, positions, colors, and locations.

F0194-3

## Example Equipment PPP Table

TABLE F0194. Power Distribution Group (Equipment) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
1-3.	FUNCTIONAL DESCRIPTION
1-3-1.	Describe how the Power Distribution Group works (functional operation). Include signal flow, sequential operation, and indications.
1-3-2.	Describe the functions of each control and indicator in each position, condition, and color.
1-4.	INTERFACE DESCRIPTION
1-4-1.	Describe the physical interface between the Power Distribution Group and related external equipments. Include names, physical appearance, reference designators, and locations. <ul style="list-style-type: none"> <li>a. Cable routing</li> <li>b. Cable terminations</li> </ul>
1-4-2.	Describe the functional interface between the Power Distribution Group and related external equipments. <ul style="list-style-type: none"> <li>a. Power sources</li> <li>b. Inputs</li> <li>c. Outputs</li> </ul>
1-5.	OPERATIONAL DESCRIPTION
1-5-1.	Describe the authority and regulations pertaining to the operation of the Power Distribution Group, including external equipments which interface with it.
1-5-2.	Describe operational tasks for the Power Distribution Group. <ul style="list-style-type: none"> <li>a. Pre-operational procedures <ul style="list-style-type: none"> <li>(1) Routine</li> <li>(2) Installation</li> </ul> </li> <li>b. Operational procedures</li> <li>c. Post-operational procedures</li> </ul>
1-5-3.	Describe indications which may occur during operation of the Power Distribution Group. Include alarms and indicators.
1-5-4.	Describe casualty/degraded/abnormal mode(s) of operation for the Power Distribution Group.

F0194-4

## Example Equipment PPP Table - Continued

TABLE F0194. Power Distribution Group (Equipment) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
1-5-5.	Describe personnel and equipment safety precautions which are to be observed during operation of the Power Distribution Group.
1-6.	MAINTENANCE DESCRIPTION
1-6-1.	<p>Define the maintenance policy for the Power Distribution Group.</p> <p>a. Preventive maintenance - the requirement for periodic performance of tasks to minimize system malfunctions by doing the following:</p> <ol style="list-style-type: none"> <li>(1) Servicing - scheduled or unscheduled inspections, cleaning, lubrication, corrosion control and any other function in support of maintaining any equipment full mission capable.</li> <li>(2) Operational checks (confidence or self test) <ol style="list-style-type: none"> <li>(a) Pre-maintenance procedures</li> <li>(b) Performance checks</li> <li>(c) Degradation/deterioration checks</li> </ol> </li> </ol> <p>b. Corrective maintenance - checks and procedures used to locate and correct malfunctions as determined by the following guides:</p> <ol style="list-style-type: none"> <li>(1) Authorized repair responsibility to correct malfunctions to the authorized maintenance level</li> <li>(2) Fault isolation - location of faults to the level of available spares, and to the authorized repair level. <ol style="list-style-type: none"> <li>(a) Equipment operation checks and tests</li> <li>(b) Fault isolation tests and procedures</li> </ol> </li> <li>(3) Analytical procedures - isolation of faults using authorized techniques not contained in prescribed maintenance documentation.</li> <li>(4) Post-maintenance procedures - procedures performed after repair.</li> </ol> <p>Describe the use of special tools and test equipment required for maintenance of the Power Distribution Group as prescribed in applicable documentation.</p>
1-6-2.	Describe preventive maintenance procedures for the Power Distribution Group. Include recognition and interpretation of indications, records, reports, and instructions.
1-6-3.	F0194-5

Example Equipment PPP Table - Continued

TABLE F0194. Power Distribution Group (Equipment) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
1-6-4.	Describe alignment and adjustment procedures for the Power Distribution Group.
1-6-5.	Describe the operational tests used for maintenance of the Power Distribution Group. Include tests' names, uses, and the procedures.
1-6-6.	Describe the recognition and interpretation of all malfunction indications for the Power Distribution Group.
1-6-7.	Describe the systematic fault isolation procedures contained in the prescribed maintenance documentation for the Power Distribution Group.
1-6-8.	Describe authorized methods to isolate faults which cannot be located using procedures contained in the prescribed documentation.
1-6-9.	Describe the procedures to disassemble, repair, and reassemble the Power Distribution Group to the authorized maintenance level.
1-6-10.	Describe the post-repair procedures for the Power Distribution Group.
1-6-11.	Describe personnel and equipment safety precautions, including tag-out procedures, which are to be observed while performing maintenance on the Power Distribution Group.
1-7.	DOCUMENTATION
1-7-1.	Describe the organization, content, and use of all technical documentation provided for use with the Power Distribution Group.
2.	<u>EQUIPMENT SKILLS</u>
2-1.	OPERATION
2-1-1.	Perform tasks for operation of the Power Distribution Group. <ul style="list-style-type: none"> <li>a. Pre-operational procedures               <ul style="list-style-type: none"> <li>(1) Routine</li> <li>(2) Installation</li> </ul> </li> </ul>

F0194-6

## Example Equipment PPP Table - Continued

TABLE F0194. Power Distribution Group (Equipment) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
	b. Operational procedures c. Post-operational procedures
2-1-2.	Recognize and interpret all indications occurring during the performance of the operating procedures, and perform appropriate operator actions in proper sequence on the Power Distribution Group.
2-1-3.	Perform tasks in the casualty/degraded/abnormal modes of operation of the Power Distribution Group.
2-1-4.	Adhere to personnel and equipment safety precautions during operational procedures of the Power Distribution Group.
2-2.	MAINTENANCE
2-2-1.	Use special tools and test equipment required for maintenance of the Power Distribution Group as prescribed in applicable documentation.
2-2-2.	Perform preventive maintenance procedures on the Power Distribution Group as scheduled by the Planned Maintenance System (PMS).
2-2-3.	Perform alignment and adjustment procedures on the Power Distribution Group.
2-2-4.	Perform operational tests used for maintenance of the Power Distribution Group.
2-2-5.	Recognize and interpret all malfunction indications for the Power Distribution Group.
2-2-6.	Perform systematic fault isolation procedures contained in prescribed maintenance documentation.
2-2-7.	Use authorized methods to isolate faults which cannot be located using the procedures in the prescribed maintenance documentation.
2-2-8.	Disassemble, repair, and reassemble the Power Distribution Group to the authorized maintenance level.
	F0194-7

Example Equipment PPP Table - Continued

TABLE F0194. Power Distribution Group (Equipment) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
2-2-9.	Perform post-repair procedures, including quality assurance procedures, on the Power Distribution Group.
2-2-10.	Adhere to personnel and equipment safety precautions, including tag-out procedures, when performing maintenance on the Power Distribution Group.

F0194-8

Example Equipment PPP Table - Continued



**EQUIPMENT PPP TABLE  
TABLE EXAMPLES**

PERSONNEL PERFORMANCE PROFILE  
FOR  
TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)  
ANTENNA SUITE

TABLE F0202  
TOWED BUOY ANTENNA AN/BRR-6  
1 AUGUST 1990

EQUIPMENT MODIFICATION RECORD

None

NEW DESIGN - DRAWING NUMBER

None

F0202-1/F0202-2

Example Equipment PPP Table Cover Page

A-2-15

TABLE F0202. Towed Buoy Antenna AN/BRR-6 (Equipment).	
ITEM NO.	KNOWLEDGE/SKILL
1.	<u>EQUIPMENT KNOWLEDGE</u>
1-1.	GENERAL
1-1-1.	State the functions of the Towed Buoy Antenna AN/BRR-6.
1-1-2.	State that the Towed Buoy Antenna AN/BRR-6 consists of the following major functional areas. Include the function of each. <ul style="list-style-type: none"> <li>a. Towed Buoy TB-17/BRR-6</li> <li>b. Receiver Group OR-197/BRR-6</li> <li>c. Special Purpose electrical Cable Assembly CS-13053/BRR-6</li> <li>d. Buoy Cradle MT-4905/BRR-6</li> <li>e. Reeling Machine RL-275/BRR-6</li> <li>f. Sensor Group OA-8906/BRR-6</li> <li>g. Buoy Door Sensing Switch</li> <li>h. Buoy Control Indicator C-1025A/BRR-6</li> <li>i. Antenna Control Indicator C-10257/BRR-6</li> <li>j. Buoy Depth Control Indicator C-10258A/BRR-6</li> <li>k. Relay Assembly RE-1115/BRR-6 (Buoy Winch Control Panel)</li> <li>l. Interconnecting Box J-3461/BRR-6</li> <li>m. Towed Array Control Indicator Panel</li> </ul> <p>Define the abbreviations, terms, and symbols used with the Towed Buoy Antenna AN/BRR-6.</p>
1-1-3.	State the operational characteristics and capabilities of the Towed Buoy Antenna AN/BRR-6.
1-1-4.	Describe the differences between models of the Towed Buoy Antenna AN/BRR-6.
1-1-5.	State the security requirements for the Towed Buoy Antenna AN/BRR-6.
1-1-6.	PHYSICAL DESCRIPTION
1-2.	Describe all major and associated components of the Towed Buoy Antenna AN/BRR-6. Include names, nomenclature, physical appearance, reference designators, locations, and construction features.
1-2-1.	

F0202-3

Example Equipment PPP Table - Continued

TABLE F0202. Towed Buoy Antenna AN/BRR-6 (Equipment) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
	<ul style="list-style-type: none"> <li>a. Towed Buoy TB-17/BRR-6</li> <li>b. Receiver Group OR-197/BRR-6</li> <li>c. Special Purpose electrical Cable Assembly CS-13053/BRR-6</li> <li>d. Buoy Cradle MT-4905/BRR-6</li> <li>e. Reeling Machine RL-275/BRR-6</li> <li>f. Sensor Group OA-8906/BRR-6</li> <li>g. Buoy Door Sensing Switch</li> <li>h. Buoy Control Indicator C-1025A/BRR-6</li> <li>i. Antenna Control Indicator C-10257/BRR-6</li> <li>j. Buoy Depth Control Indicator C-10258A/BRR-6</li> <li>k. Relay Assembly RE-1115/BRR-6 (Buoy Winch Control Panel)</li> <li>l. Interconnecting Box J-3461/BRR-6</li> <li>m. Towed Array Control Indicator Panel</li> </ul>
1-2-2.	Describe the displays, controls, and indicators directly associated with the Towed Buoy Antenna AN/BRR-6. Include names reference designators, positions, colors, and locations
	FUNCTIONAL DESCRIPTION
1-3.	
1-3-1.	Describe how the Towed Buoy Antenna AN/BRR-6 works (functional operation). Include signal flow, sequential operation, and indications.
1-3-2.	Describe the functions of each control and indicator in each position, condition, and color.
	INTERFACE DESCRIPTION
1-4.	
1-4-1.	<p>Describe the physical interface between the Towed Buoy Antenna AN/BRR-6 and related external equipments. Include names physical appearance, reference designators, and locations.</p> <ul style="list-style-type: none"> <li>a. Cable routing</li> <li>b. Cable terminations</li> <li>c. Hydraulic piping</li> </ul>
1-4-2.	Describe the functional interface between the Towed Buoy Antenna AN/BRR-6 and related external equipments.

F0202-4

## Example Equipment PPP Table - Continued

TABLE F0202. Towed Buoy Antenna AN/BRR-6 (Equipment) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
	<ul style="list-style-type: none"> <li>a. Power sources</li> <li>b. Input signals</li> <li>c. Output signals</li> <li>d. Hydraulics</li> </ul>
1-5.	OPERATIONAL DESCRIPTION
1-5-1.	Describe the authority and regulations pertaining to the operation of the Towed Buoy Antenna AN/BRR-6, including external equipments which interface with it.
1-5-2.	Describe operational tasks for the Towed Buoy Antenna AN/BRR-6. <ul style="list-style-type: none"> <li>a. Pre-operational procedures               <ul style="list-style-type: none"> <li>(1) Routine</li> <li>(2) Installation</li> </ul> </li> <li>b. Operational procedures</li> <li>c. Post-operational procedures</li> </ul>
1-5-3.	Describe indications which may occur during operation of the Towed Buoy Antenna AN/BRR-6. Include alarms, indicators, and displays.
1-5-4.	Describe casualty/degraded/abnormal mode(s) of operation for the Towed Buoy Antenna AN/BRR-6.
1-5-5.	Describe personnel and equipment safety precautions which are to be observed during operation of the Towed Buoy Antenna AN/BRR-6.
1-6.	MAINTENANCE DESCRIPTION
1-6-1.	Define the maintenance policy for the Towed Buoy Antenna AN/BRR-6. <ul style="list-style-type: none"> <li>a. Preventive maintenance - the requirement for periodic performance of tasks to minimize system malfunctions by doing the following:               <ul style="list-style-type: none"> <li>(1) Servicing - scheduled or unscheduled inspections, cleaning, lubrication, corrosion control and any other function in support of maintaining any equipment full mission capable.</li> </ul> </li> </ul>

F0202-5

Example Equipment PPP Table - Continued

TABLE F0202. Towed Buoy Antenna AN/BRR-6 (Equipment) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
	<p>(2) Operational checks (confidence or self test)</p> <p>(a) Pre-maintenance procedures</p> <p>(b) Performance checks</p> <p>(c) Degradation/deterioration checks</p> <p>b. Corrective maintenance - checks and procedures used to locate and correct malfunctions as determined by the following guides:</p> <p>(1) Authorized repair responsibility to correct malfunctions to the authorized maintenance level</p> <p>(2) Fault isolation - location of faults to the level of available spares, and to the authorized repair level.</p> <p>(a) Equipment operation checks and tests</p> <p>(b) Fault isolation tests and procedures</p> <p>(3) Analytical procedures - isolation of faults using authorized techniques not contained in prescribed maintenance documentation.</p> <p>(4) Post-maintenance procedures - procedures performed after repair.</p>
1-6-2.	Describe the use of special tools and test equipment required for maintenance of the Towed Buoy Antenna AN/BRR-6 as prescribed in applicable documentation.
1-6-3.	Describe preventive maintenance procedures for the Towed Buoy Antenna AN/BRR-6. Include recognition and interpretation of indications, records, reports, and instructions.
1-6-4.	Describe alignment, adjustment, and calibration procedures for the Towed Buoy Antenna AN/BRR-6.
1-6-5.	Describe the operational tests used for maintenance of the Towed Buoy Antenna AN/BRR-6. Include tests' names, uses, and the procedures.
1-6-6.	Describe the recognition and interpretation of all malfunction indication for the Towed Buoy Antenna AN/BRR-6.
1-6-7.	Describe the systematic fault isolation procedures contained in the prescribed maintenance documentation for the Towed Buoy Antenna AN/BRR-6.

F0202-6

## Example Equipment PPP Table - Continued

TABLE 4J03. Towed Buoy Antenna AN/BRR-6 (Equipment) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
1-6-8.	Describe authorized methods to isolate faults which cannot be located using procedures contained in the prescribed documentation.
1-6-9.	Describe the procedures to disassemble, repair, and reassemble the Towed Buoy Antenna AN/BRR-6 to the authorized maintenance level.
1-6-10.	Describe the post-repair procedures for the Towed Buoy Antenna AN/BRR-6.
1-6-11.	Describe personnel and equipment safety precautions, including tag-out procedures, which are to be observed while performing maintenance on the Towed Buoy Antenna AN/BRR-6.
1-7.	DOCUMENTATION
1-7-1.	Describe the organization, content, and use of all technical documentation provided for use with the Towed Buoy Antenna AN/BRR-6.
2.	<u>EQUIPMENT SKILLS</u>
2-1.	OPERATION
2-1-1.	Perform tasks for operation of the Towed Buoy Antenna AN/BRR-6. <ul style="list-style-type: none"> <li>a. Pre-operational procedures               <ul style="list-style-type: none"> <li>(1) Routine</li> <li>(2) Installation</li> </ul> </li> <li>b. Operational procedures</li> <li>c. Post-operational procedures</li> </ul>
2-1-2.	Recognize and interpret all indications occurring during the performance of the operating procedures, and perform appropriate operator actions in proper sequence on the Towed Buoy Antenna AN/BRR-6.
2-1-3.	Perform tasks in the casualty/degraded/abnormal modes of operation of the Towed Buoy Antenna AN/BRR-6.
2-1-4.	Adhere to personnel and equipment safety precautions during operational procedures of the Towed Buoy Antenna AN/BRR-6.

F0202-7

Example Equipment PPP Table - Continued

TABLE F0202. Towed Buoy Antenna AN/BRR-6 (Equipment) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
2-2.	MAINTENANCE
2-2-1.	Use special tools and test equipment required for maintenance of the Towed Buoy Antenna AN/BRR-6 as prescribed in applicable documentation.
2-2-2.	Perform preventive maintenance procedures on the Towed Buoy Antenna AN/BRR-6 as scheduled by the Planned Maintenance System (PMS).
2-2-3.	Perform alignment, adjustment, and calibration procedures on the Towed Buoy Antenna AN/BRR-6.
2-2-4.	Perform operational tests used for maintenance of the Towed Buoy Antenna AN/BRR-6.
2-2-5.	Recognize and interpret all malfunction indications for the Towed Buoy Antenna AN/BRR-6.
2-2-6.	Perform systematic fault isolation procedures contained in prescribed maintenance documentation.
2-2-7.	Use authorized methods to isolate faults which cannot be located using the procedures in the prescribed maintenance documentation.
2-2-8.	Disassemble, repair, and reassemble the Towed Buoy Antenna AN/BRR-6 to the authorized maintenance level.
2-2-9.	Perform post-repair procedures, including quality assurance procedures, on the Towed Buoy Antenna AN/BRR-6.
2-2-10.	Adhere to personnel and equipment safety precautions, including tag-out procedures, when performing maintenance on the Towed Buoy Antenna AN/BRR-6.

F0202-8

Example Equipment PPP Table - Continued



**SUBSYSTEM PPP**

**TABLE EXAMPLE**

PERSONNEL PERFORMANCE PROFILE  
FOR  
TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

TABLE F0156  
DATA SWITCHING SUBSYSTEM (DSS)

1 AUGUST 1990

SUBSYSTEM MODIFICATION RECORD

None

NEW DESIGN - DRAWING NUMBER

None

F0156-1/F0156-2

Example Subsystem PPP Table Cover Page

TABLE F0156. Data Switching Subsystem (DSS).

ITEM NO.	KNOWLEDGE/SKILL
1.	<u>SUBSYSTEM KNOWLEDGE</u>
1-1.	GENERAL
1-1-1.	State the functions of the Data Switching Subsystem (DSS).
1-1-2.	State that the DSS consists of the following major functional areas. Include the function of each. <ul style="list-style-type: none"> <li>a. PP-7474/BSC-1, PP-7475/BSC-1 Power Supplies</li> <li>b. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units</li> <li>c. Signal Data Converter CV-3510B/UG</li> <li>d. TSEC/KG-84C <ul style="list-style-type: none"> <li>(1) Remote Phase Control Unit (Part of Comparator CM-507/BSC-1)</li> </ul> </li> <li>e. TSEC/KG-36</li> <li>f. TSEC/KWR-46</li> <li>g. TSEC/KY-75</li> <li>h. TSEC/KY-58</li> <li>i. Control Box C-12118/BSC-1</li> </ul>
1-1-3.	Define the abbreviations, terms, and symbols used with the DSS.
1-1-4.	State the operational characteristics and capabilities of the DSS.
1-1-5.	State the security requirements for the DSS.
1-2.	PHYSICAL DESCRIPTION
1-2-1.	Describe all major and associated components of the DSS. Include names, nomenclature, physical appearance, reference designators, locations, and construction features. <ul style="list-style-type: none"> <li>a. PP-7474/BSC-1, PP-7475/BSC-1 Power Supplies</li> <li>b. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units</li> <li>c. Signal Data Converter CV-3510B/UG</li> <li>d. TSEC/KG-84C <ul style="list-style-type: none"> <li>(1) Remote Phase Control Unit (Part of Comparator CM-507/BSC-1)</li> </ul> </li> </ul>

F0156-3

### Example Subsystem PPP Table

TABLE F0156. Data Switching Subsystem (DSS) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
	<ul style="list-style-type: none"> <li>e. TSEC/KG-36</li> <li>f. TSEC/KWR-46</li> <li>g. TSEC/KY-75</li> <li>h. TSEC/KY-58</li> <li>i. Control Box C-12118/BSC-1</li> </ul>
1-1-2.	Describe the displays, controls, and indicators directly associated with the DSS. Include names, reference designators, positions, colors, and locations.
1-3.	FUNCTIONAL DESCRIPTION
1-3-1.	Describe how the DSS works (functional operation). Include types of signals, signal flow, modes, inputs and outputs, sequence of events, and protective devices.
1-3-2.	Describe the functions of each control and indicator in each position, condition, and color.
1-4.	INTERFACE DESCRIPTION
1-4-1.	<p>Describe the physical interface between the DSS and related external equipments. Include names, physical appearance, reference designators, and locations.</p> <ul style="list-style-type: none"> <li>a. Cable routing</li> <li>b. Cable terminations</li> <li>c. Junction boxes</li> </ul>
1-4-2.	<p>Describe the functional interface between the DSS and related external equipments.</p> <ul style="list-style-type: none"> <li>a. Power sources</li> <li>b. Input signals</li> <li>c. Output signals</li> <li>d. Control signals</li> </ul>
1-5.	OPERATIONAL DESCRIPTION
1-5-1.	Describe the authority and regulations pertaining to the operation of the DSS, including external equipments which interface with it.

F0156-4

Example Subsystem PPP Table - Continued

TABLE F0156. Data Switching Subsystem (DSS) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
1-5-2.	<p>Describe operational tasks for the DSS.</p> <ul style="list-style-type: none"> <li>a. Pre-operational procedures <ul style="list-style-type: none"> <li>(1) Routine</li> <li>(2) Installation</li> </ul> </li> <li>b. Operational procedures</li> <li>c. Post-operational procedures</li> </ul>
1-5-3.	<p>Describe indications which may occur during operation of the DSS. Include alarms, indicators, and displays.</p>
1-5-4.	<p>Describe casualty/degraded/abnormal mode(s) of operation for the DSS.</p>
1-5-5.	<p>Describe the data logging requirements for the DSS. Include logging methods, types of data logged, and disposition.</p>
1-5-6.	<p>Describe personnel and equipment safety precautions which are to be observed during operation of the DSS.</p>
1-6.	<p>MAINTENANCE DESCRIPTION</p>
1-6-1.	<p>Define the maintenance policy for the DSS.</p> <ul style="list-style-type: none"> <li>a. Preventive maintenance - the requirement for periodic performance of tasks to minimize system malfunctions by doing the following: <ul style="list-style-type: none"> <li>(1) Servicing - scheduled or unscheduled inspections, cleaning, lubrication, corrosion control and any other function in support of maintaining any equipment full mission capable.</li> <li>(2) Operational checks (confidence or self test) <ul style="list-style-type: none"> <li>(a) Premaintenance procedures</li> <li>(b) Performance checks</li> <li>(c) Degradation/deterioration checks</li> </ul> </li> </ul> </li> <li>b. Corrective maintenance - checks and procedures used to locate and correct malfunctions as determined by the following guides: <ul style="list-style-type: none"> <li>(1) Authorized repair responsibility to correct malfunctions to the authorized maintenance level</li> <li>(2) Fault isolation - location of faults to the level of available spares, and to the authorized repair level. <ul style="list-style-type: none"> <li>(a) Equipment operation checks and tests</li> <li>(b) Fault isolation tests and procedures</li> </ul> </li> </ul> </li> </ul>

F0156-5

Example Subsystem PPP Table - Continued

TABLE F0156. Data Switching Subsystem (DSS) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
	<p>(3) Analytical procedures - isolation of faults using authorized techniques not contained in prescribed maintenance documentation.</p> <p>(4) Post-maintenance procedures - procedures performed after repair.</p>
1-6-2.	Describe the use of special tools and test equipment required for maintenance of the DSS as prescribed in applicable documentation.
1-6-3.	Describe preventive maintenance procedures for the DSS. Include recognition and interpretation of indications, records, reports, and instructions.
1-6-4.	Describe alignment, adjustment, and calibration procedures for the DSS.
1-6-5.	Describe the operational tests and diagnostic programs used for maintenance of the DSS. Include tests' names, uses, and the procedures.
1-6-6.	Describe the recognition and interpretation of all malfunction indications for the DSS.
1-6-7.	Describe the systematic fault isolation procedures contained in the prescribed maintenance documentation for the DSS.
1-6-8.	Describe authorized methods to isolate faults which cannot be located using procedures contained in the prescribed documentation.
1-6-9.	Describe the procedures to disassemble, repair, and reassemble the DSS to the authorized maintenance level.
1-6-10.	Describe the post-repair procedures for the DSS.
1-6-11.	Describe personnel and equipment safety precautions, including tag-out procedures, which are to be observed while performing maintenance on the DSS.
1-7.	DOCUMENTATION
1-7-1.	Describe the organization, content, and use of all technical documentation provided for use with the DSS.

F0156-6

Example Subsystem PPP Table - Continued

TABLE F0156. Data Switching Subsystem (DSS) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
2.	<u>SUBSYSTEM SKILLS</u>
2-1.	OPERATION
2-1-1.	Perform tasks for operation of the DSS. a. Pre-operational procedures (1) Routine (2) Installation b. Operational procedures c. Post-operational procedures
2-1-2.	Recognize and interpret all indications occurring during performance of the operating procedures, and perform appropriate operator actions in proper sequence on the DSS.
2-1-3.	Perform tasks in the casualty/degraded/abnormal modes of operation of the DSS.
2-1-4.	Perform data logging requirements for the DSS.
2-1-5.	Adhere to personnel and equipment safety precautions during operational procedures of the DSS.
2-2.	MAINTENANCE
2-2-1.	Use special tools and test equipment required for maintenance of the DSS prescribed in applicable documentation.
2-2-2.	Perform preventive maintenance procedures on the DSS as scheduled by the Planned Maintenance System (PMS).
2-2-3.	Perform alignment, adjustment, and calibration procedures on the DSS.
2-2-4.	Perform operational tests and diagnostic programs used for maintenance of the DSS.
2-2-5.	Recognize and interpret all malfunction indications for the DSS.
2-2-6.	Perform systematic fault isolation procedures contained in prescribed maintenance documentation.

F0156-7

Example Subsystem PPP Table - Continued

TABLE F0156. Data Switching Subsystem (DSS) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
2-2-7.	Use authorized methods to isolate faults which cannot be located using the procedures in the prescribed maintenance documentation.
2-2-8.	Disassemble, repair, and reassemble the DSS to the authorized maintenance level.
2-2-9.	Perform post-repair procedures, including quality assurance procedures, on the DSS.
2-2-10.	Adhere to personnel and equipment safety precautions, including tag-out procedures, when performing maintenance on the DSS.

F0156-8

Example Subsystem PPP Table - Continued



**SYSTEM PPP**

**TABLE EXAMPLE**

PERSONNEL PERFORMANCE PROFILE  
FOR  
TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

TABLE F0147  
TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)  
1 AUGUST 1990

SYSTEM MODIFICATION RECORD

None

NEW DESIGN - DRAWING NUMBER

None

F0147-1/F0147-2

Example System PPP Table Cover Page

A-2-35

TABLE F0147. TRIDENT Exterior Communications System (ECS).

ITEM NO.	KNOWLEDGE/SKILL
1.	<u>SYSTEM KNOWLEDGE</u>
1-1.	GENERAL
1-1-1.	State the functions of the Exterior Communications System (ECS).
1-1-2.	State that the ECS consists of the following major functional areas. Include the function of each. <ul style="list-style-type: none"> <li>a. Control, Monitor, and Test (CMT) Subsystem</li> <li>b. Data Switching Subsystem (DSS)</li> <li>c. Antenna Interface Subsystem (AIS)</li> <li>d. Special Communications (SPECOM) Subsystem</li> <li>e. Very Low Frequency/Low Frequency (VLF/LF) Subsystem</li> <li>f. High Frequency/Ultra High Frequency (HF/UHF) Subsystem</li> <li>g. Emergency Communications Subsystem</li> <li>h. Support Subsystem</li> <li>i. Antenna Suite</li> <li>j. Identification Friend or Foe</li> <li>k. Extremely Low Frequency (ELF) Subsystem</li> </ul>
1-1-3.	Define the abbreviations, terms, and symbols used with the ECS.
1-1-4.	State the operational characteristics and capabilities of the ECS.
1-1-5.	State the security requirements for the ECS.
1-2.	PHYSICAL DESCRIPTION
1-2-1.	Describe all major and associated components of the ECS. Include names, nomenclature, physical appearance, reference designators, locations, and construction features. <ul style="list-style-type: none"> <li>a. Control, Monitor, and Test (CMT) Subsystem</li> <li>b. Data Switching Subsystem (DSS)</li> <li>c. Antenna Interface Subsystem (AIS)</li> <li>d. Special Communications (SPECOM) Subsystem</li> <li>e. Very Low Frequency/Low Frequency (VLF/LF) Subsystem</li> <li>f. High Frequency/Ultra High Frequency (HF/UHF) Subsystem</li> <li>g. Emergency Communications Subsystem</li> <li>h. Support Subsystem</li> </ul>

F0147-3

## Example System PPP Table

TABLE F0147. TRIDENT Exterior Communications System (ECS) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
	<ul style="list-style-type: none"> <li>i. Antenna Suite</li> <li>j. Identification Friend or Foe</li> <li>k. Extremely Low Frequency (ELF) Subsystem</li> </ul>
1-2-2.	Describe the displays, controls, and indicators directly associated with the ECS. Include names, reference designators, positions, colors, and locations.
1-3.	FUNCTIONAL DESCRIPTION
1-3-1.	Describe how the ECS works (functional operation). Include types of signals, signal flow, modes, inputs and outputs, sequence of events, and protective devices.
1-3-2.	Describe the functions of each control and indicator in each position, condition, and color.
1-3-3.	<p>Describe each program, subprogram, and routine used with the ECS. Include name, program number, and assumptions and constraints imposed.</p> <ul style="list-style-type: none"> <li>a. CP</li> <li>b. MP</li> <li>c. VLF</li> <li>d. On-line test</li> <li>e. Off-line utility package</li> </ul>
1-4.	INTERFACE DESCRIPTION
1-4-1.	<p>Describe the physical interface between the ECS and related external equipments. Include names, physical appearance, reference designators, and locations.</p> <ul style="list-style-type: none"> <li>a. Cable routing</li> <li>b. Cable terminations</li> <li>c. Junction boxes</li> <li>d. Cooling water piping</li> </ul>
1-4-2.	<p>Describe the functional interface between the ECS and related external equipments.</p> <ul style="list-style-type: none"> <li>a. Power sources</li> <li>b. Input signals</li> <li>c. Output signals</li> <li>d. Control signals</li> </ul>

F0147-4

Example System PPP Table - Continued

TABLE F0147. TRIDENT Exterior Communications System (ECS) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
1-5.	OPERATIONAL DESCRIPTION
1-5-1.	Describe the authority and regulations pertaining to the operation of the ECS, including external equipments which interface with it.
1-5-2.	Describe operational tasks for the ECS. a. Pre-operational procedures (1) Routine (2) Installation b. Operational procedures c. Post-operational procedures
1-5-3.	Describe indications which may occur during operation of the ECS. Include alarms, indicators, displays, and readouts.
1-5-4.	Describe casualty/degraded/abnormal mode(s) of operation for the ECS.
1-5-5.	Describe the data logging requirements for the ECS. Include logging methods, types of data logged, and disposition.
1-5-6.	Describe personnel and equipment safety precautions which are to be observed during operation of the ECS.
1-6.	MAINTENANCE DESCRIPTION
1-6-1.	Define the maintenance policy for the ECS. a. Preventive maintenance - the requirement for periodic performance of tasks to minimize system malfunctions by doing the following: (1) Servicing - scheduled or unscheduled inspections, cleaning, lubrication, corrosion control and any other function in support of maintaining any equipment full mission capable. (2) Operational checks (confidence or self test) (a) Pre-maintenance procedures (b) Performance checks (c) Degradation/deterioration checks b. Corrective maintenance - checks and procedures used to locate and correct malfunctions as determined by the following guides:

F0147-5

Example System PPP Table - Continued

TABLE F0147. TRIDENT Exterior Communications System (ECS) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
	<ul style="list-style-type: none"> <li>(1) Authorized repair responsibility to correct malfunctions to the authorized maintenance level</li> <li>(2) Fault isolation - location of faults to the level of available spares, and to the authorized repair level.               <ul style="list-style-type: none"> <li>(a) Equipment operation checks and tests</li> <li>(b) Fault isolation tests and procedures</li> </ul> </li> <li>(3) Analytical procedures - isolation of faults using authorized techniques not contained in prescribed maintenance documentation.</li> <li>(4) Post-maintenance procedures - procedures performed after repair.</li> </ul>
1-6-2.	Describe the use of special tools and test equipment required for maintenance of the ECS as prescribed in applicable documentation.
1-6-3.	Describe preventive maintenance procedures for the ECS. Include recognition and interpretation of indications, records, reports, and instructions.
1-6-4.	Describe alignment, adjustment, and calibration procedures for the ECS.
1-6-5.	Describe the operational tests and diagnostic programs used for maintenance of the ECS. Include tests' names, uses, and the procedures.
1-6-6.	Describe the recognition and interpretation of all malfunction indications for the ECS.
1-6-7.	Describe the systematic fault isolation procedures contained in the prescribed maintenance documentation for the ECS.
1-6-8.	Describe authorized methods to isolate faults which cannot be located using procedures contained in the prescribed documentation.
1-6-9.	Describe the procedures to disassemble, repair, and reassemble the ECS to the authorized maintenance level.
1-6-10.	Describe the post-repair procedures for the ECS.

F0147-6

Example System PPP Table - Continued

TABLE F0147. TRIDENT Exterior Communications System (ECS) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
1-6-11.	Describe personnel and equipment safety precautions, including tag-out procedures, which are to be observed while performing maintenance on the ECS.
1-7.	DOCUMENTATION
1-7-1.	Describe the organization, content, and use of all technical documentation provided for use with the ECS.
2.	<u>SYSTEM SKILLS</u>
2-1.	OPERATION
2-1-1.	Perform tasks for operation of the ECS. a. Pre-operational procedures (1) Routine (2) Installation b. Operational procedures c. Post-operational procedures
2-1-2.	Recognize and interpret all indications occurring during the performance of the operating procedures, and perform appropriate operator actions in proper sequence on the ECS.
2-1-3.	Perform tasks in the casualty/degraded/abnormal modes of operation of the ECS.
2-1-4.	Perform data logging requirements for the ECS.
2-1-5.	Adhere to personnel and equipment safety precautions during operational procedures of the ECS.
2-2.	MAINTENANCE
2-2-1.	Use special tools and test equipment required for maintenance of the ECS as prescribed in applicable documentation.
2-2-2.	Perform preventive maintenance procedures on the ECS as scheduled by the Planned Maintenance System (PMS).
2-2-3.	Perform alignment, adjustment, and calibration procedures on the ECS.

F0147-7

Example System PPP Table - Continued

TABLE F0147. TRIDENT Exterior Communications System (ECS) - Continued.

ITEM NO.	KNOWLEDGE/SKILL
2-2-4.	Perform operational tests and diagnostic programs used for maintenance of the ECS.
2-2-5.	Recognize and interpret all malfunction indications for the ECS.
2-2-6.	Perform systematic fault isolation procedures contained in prescribed maintenance documentation.
2-2-7.	Use authorized methods to isolate faults which cannot be located using the procedures in the prescribed maintenance documentation.
2-2-8.	Disassemble, repair, and reassemble the ECS to the authorized maintenance level.
2-2-9.	Perform post-repair procedures, including quality assurance procedures, on the ECS.
2-2-10.	Adhere to personnel and equipment safety precautions, including tag-out procedures, when performing maintenance on the ECS.

F0147-8

Example System PPP Table - Continued



**TASK/FUNCTION PPP**

**TABLE EXAMPLE**

NAVEDTRA 38002 (VOLUME 1) PART 2  
REVISION 4

PERSONNEL PERFORMANCE PROFILE  
FOR  
TASK/FUNCTION KNOWLEDGE AND SKILL

TABLE

B0076

MOTORIZED VEHICLE DRIVING REQUIREMENTS

JANUARY 1993

SYSTEM/SUBSYSTEM/EQUIPMENT MODIFICATION RECORD

NONE

B0076-1/B0076-2

Example Task/Function PPP Table Cover Page

TABLE B0076.      Motorized Vehicle Driving Requirements	
ITEM NO.	KNOWLEDGE/SKILL
1.	<u>KNOWLEDGE</u>
1-1.	BASIC DRIVING
1-1-1.	Describe vehicle inspection points and criteria. <ul style="list-style-type: none"> <li>a. Bumpers</li> <li>b. Headlights</li> <li>c. Safety glass</li> <li>d. Windshield wipers</li> <li>e. Brakes (foot and parking)</li> <li>f. Muffler and exhaust system</li> <li>g. Signal lights</li> <li>h. Tires</li> <li>i. License plate and light</li> <li>j. Brake and tail lights</li> <li>k. Mirror(s)</li> <li>l. Horn</li> <li>m. Restraint devices (seat belts, shoulder harness, child restraints)</li> </ul>
1-1-2.	Describe driving maneuvers. <ul style="list-style-type: none"> <li>a. Negotiating intersection</li> <li>b. Left and right turns</li> <li>c. Reversing direction (U-turn)</li> <li>d. Starting and stopping, including quick stop</li> <li>e. Signaling (hand/arm, automatic)</li> <li>f. Selecting proper lane</li> <li>g. Parallel parking</li> <li>h. Backing</li> <li>i. Following a vehicle</li> <li>j. Speed control</li> <li>k. Night driving</li> <li>l. Winter driving</li> <li>m. Interstate highway driving</li> <li>n. Driving in rain/fog</li> <li>o. Skidding</li> </ul>
1-1-3.	Describe rules of the road. <ul style="list-style-type: none"> <li>a. Obeying officers</li> <li>b. Changing lanes</li> <li>c. Slow moving vehicles</li> <li>d. Coasting</li> <li>e. Use of headlights</li> <li>f. Throwing material from vehicles</li> <li>g. Speed limits and adjusting speed conditions</li> <li>h. Passing</li> <li>i. Yielding to emergency vehicles and school buses</li> <li>j. Railroad crossings</li> <li>k. Traffic signs and signals</li> </ul>

B0076-3

Example Task/Function PPP Table - Continued

TABLE B0076. Motorized Vehicle Driving Requirements - Continued

ITEM NO.	KNOWLEDGE/SKILL
1-1-3. (Cont.)	(1) color (2) shape l. Turns and signaling m. Right-of-way n. Highway markings o. Interstate highway procedures p. Night driving and headlight courtesy q. Winter driving r. Driving in rain/fog
1-1-4.	List recommended safety and emergency equipment.
1-1-5.	Describe procedures when involved in an accident.
1-1-6.	Describe procedures when first on the scene of an accident.
1-1-7.	Describe personnel and equipment safety precautions applicable to basic driving.
1-1-8.	Describe initial procedures for emergency conditions. a. Flooded engine (stall) b. Accelerator jammed c. Brake failure (including wet brakes) d. Tire blowout e. Right wheels off pavement f. Car approaching in your lane. g. Fire
1-1-9.	Describe conditions which degrade driving behavior and ability. a. Alcohol b. Fatigue c. Highway hypnosis
1-1-10.	Describe the Implied Consent Law and the consequences of arrest for Driving While Intoxicated (DWI).
1-2.	EMERGENCY DRIVING
1-2-1.	Describe operation of collision avoidance equipment including authority and regulations for use. a. Horn b. Siren c. Lights d. Bell
1-2-2.	Describe accident prevention maneuvers including occasions for use, hazards involved, and procedures. a. Swerving to avoid stationary objects b. Swerving to avoid moving objects c. Controlled skid

B0076-4

Example Tank/Function PPP Table - Continued

TABLE B0076. Motorized Vehicle Driving Requirements - Continued	
ITEM NO.	KNOWLEDGE/SKILL
1-2-3.	Describe transiting, braking, and stopping maneuvers on hazardous surfaces, including occasions for use, hazards involved, and procedures: a. Wet pavement b. Icy pavement c. Sand d. Gravel e. Mud f. Snow g. Rain h. Fog
1-2-4.	Describe high speed maneuvers including applicable regulations, occasions for use, hazards involved, and procedures. a. Passing b. Turning c. Going through intersections d. Reversing direction
1-2-5.	Describe emergency escort procedures including applicable regulations, occasions for use, hazards involved, and procedures. a. Leading b. Following
1-2-6.	Describe abbreviations, terms, and symbols associated with emergency driving. a. Hydroplaning b. Fishtailing
1-2-7.	Describe the organization, content, and use of documentation applicable to emergency driving.
1-2-8.	Describe personnel and equipment safety precautions applicable to emergency driving.
1-2-9.	Describe situations which require emergency driving, including applicable regulations. a. Medical emergencies b. Law enforcement emergencies c. Fire/natural disasters d. Courier/message delivery
1-2-10.	Describe the effects of environmental conditions on emergency driving, including visibility, speed constraints, and traction effects. a. Rain b. Snow c. Ice d. Sand e. Gravel f. Mud g. Oil/lubricants h. Fog

B0076-5

Example Task/Function PPP Table - Continued

TABLE B0076. Motorized Vehicle Driving Requirements - Continued

ITEM NO.	KNOWLEDGE/SKILL
2.	<u>SKILLS</u>
2-1.	BASIC DRIVING
2-1-1.	Perform vehicle inspection. <ol style="list-style-type: none"> <li>a. Bumpers</li> <li>b. Headlights</li> <li>c. Safety glass</li> <li>d. Windshield wipers</li> <li>e. Brakes (foot and parking)</li> <li>f. Muffler and exhaust system</li> <li>g. Signal lights</li> <li>h. Tires</li> <li>i. License plate and light</li> <li>j. Brake and tail lights</li> <li>k. Mirror(s)</li> <li>l. Horn</li> <li>m. Restraint devices (seat belts, shoulder harness, child restraints)</li> </ol>
2-1-2.	Perform driving maneuvers. <ol style="list-style-type: none"> <li>a. Negotiating intersection</li> <li>b. Left and right turns</li> <li>c. Reversing direction (U-turn)</li> <li>d. Starting and stopping, including quick stop</li> <li>e. Signaling (hand/arm, automatic)</li> <li>f. Selecting proper lane</li> <li>g. Parallel parking</li> <li>h. Backing</li> <li>i. Following a vehicle</li> <li>j. Speed control</li> <li>k. Night driving</li> <li>l. Winter driving</li> <li>m. Interstate highway driving</li> <li>n. Driving in rain/fog</li> <li>o. Skidding</li> </ol>
2-1-3.	Adhere to rules of the road applicable to basic driving. <ol style="list-style-type: none"> <li>a. Obeying officers</li> <li>b. Changing lanes</li> <li>c. Slow moving vehicles</li> <li>d. Coasting</li> <li>e. Use of headlights</li> <li>f. Throwing material from vehicles</li> <li>g. Speed limits and adjusting speed to conditions</li> <li>h. Passing</li> <li>i. Yielding to emergency vehicles and school buses</li> <li>j. Railroad crossings</li> <li>k. Traffic signs and signals               <ol style="list-style-type: none"> <li>(1) color</li> <li>(2) shape</li> </ol> </li> <li>l. Turns and signaling</li> <li>m. Right-of-way</li> <li>n. Highway markings</li> </ol>

B0076-6

Example Task/Function PPP Table - Continued

TABLE B0076. Motorized Vehicle Driving Requirements - Continued	
ITEM NO.	KNOWLEDGE/SKILL
2-1-3. (Cont.)	<ul style="list-style-type: none"> <li>o. Interstate highway procedures</li> <li>p. Night driving and headlight courtesy</li> <li>q. Winter driving</li> <li>r. Driving in rain/fog</li> </ul>
2-1-4.	Adhere to personnel and equipment safety precautions applicable to basic driving.
2-2-1.	Perform emergency procedures for: <ul style="list-style-type: none"> <li>a. Flooded engine (stall)</li> <li>b. Accelerator jammed</li> <li>c. Brake failure (including wet brakes)</li> <li>d. Tire blowout</li> <li>e. Right wheels off pavement</li> <li>f. Car approaching in your lane</li> <li>g. Fire</li> </ul>
2-2.	EMERGENCY DRIVING
2-2-1.	Operate collision avoidance equipment. <ul style="list-style-type: none"> <li>a. Horn</li> <li>b. Siren</li> <li>c. Lights</li> <li>d. Bell</li> </ul>
2-2-2.	Perform accident preventing maneuvers. <ul style="list-style-type: none"> <li>a. Swerving to avoid stationary objects</li> <li>b. Swerving to avoid moving objects</li> <li>c. Controlled skid</li> </ul>
2-2-3.	Perform transiting, braking, and stopping maneuvers on hazardous surfaces. <ul style="list-style-type: none"> <li>a. Wet pavement</li> <li>b. Icy pavement</li> <li>c. Sand</li> <li>d. Gravel</li> <li>e. Mud</li> <li>f. Snow</li> </ul>
2-2-4.	Perform high speed maneuvers. <ul style="list-style-type: none"> <li>a. Passing</li> <li>b. Turning</li> <li>c. Going through intersections</li> <li>d. Reversing direction</li> </ul>
2-2-5.	Perform emergency escort procedures. <ul style="list-style-type: none"> <li>a. Leading</li> <li>b. Following</li> </ul>
2-2-6.	Adhere to personnel and equipment safety precautions applicable to emergency driving.

B0076-7

Example Task/Function PPP Table - Continued

TABLE B0076. Motorized Vehicle Driving Requirements - Continued

ITEM NO.	KNOWLEDGE/SKILL
2-2-7.	<p>Comply with applicable regulations while performing emergency driving.</p> <ul style="list-style-type: none"> <li>a. Medical emergencies</li> <li>b. Law enforcement</li> <li>c. Fire/natural disasters</li> <li>d. Courier/message delivery</li> </ul>

B0076-7

Example Task/Function PPP Table - Continued



**BACKGROUND PPP**

**TABLE EXAMPLE**

PERSONNEL PERFORMANCE PROFILE  
FOR  
INTRODUCTION BACKGROUND KNOWLEDGE AND SKILL

TABLE A0002

BASIC ELECTRICITY

SYSTEM MODIFICATION RECORD

The system covered in this profile has been altered by the  
following Engineering Changes/SPALTs/Field Changes/SHIPALTs:

None

Change 1

A0002-1/A0002-2

Example Background PPP Table Cover Page

TABLE A0002. BASIC ELECTRICITY (BACKGROUND)	
ITEM NO.	KNOWLEDGE/SKILL
1.	KNOWLEDGE
1-1.	Define the abbreviations, terms, and symbols associated with basic electricity.
1-2.	Describe the structure of matter with respect to: <ul style="list-style-type: none"> <li>a. States of matter</li> <li>b. Basic particles of matter <ul style="list-style-type: none"> <li>1. Molecule</li> <li>2. Atom</li> <li>3. Subatomic particles</li> </ul> </li> <li>c. Energy level</li> </ul>
1-3.	Describe the designators used to indicate difference between atoms. <ul style="list-style-type: none"> <li>a. Shell and subshell</li> <li>b. Atomic weight and atomic number</li> <li>c. Valence</li> </ul>
1-4.	Define electrical conductivity and its characteristics in different materials.
1-5.	Describe the principles of electrostatics. <ul style="list-style-type: none"> <li>a. Law of charged bodies</li> <li>b. Method of charging <ul style="list-style-type: none"> <li>1. Friction</li> <li>2. Contact</li> <li>3. Induction</li> </ul> </li> <li>c. Measurements of charges <ul style="list-style-type: none"> <li>1. Coulomb's law</li> <li>2. Electroscope</li> </ul> </li> <li>d. Discharging</li> <li>e. Law of conservation of charge</li> <li>f. Electrostatic lines of force</li> <li>g. Prime electrostatic generators</li> </ul>
1-6.	Describe principles of magnetism. <ul style="list-style-type: none"> <li>a. Natural and artificial magnets</li> <li>b. Magnetic poles</li> <li>c. Theories of magnetism <ul style="list-style-type: none"> <li>1. Weber's theory</li> <li>2. Domain theory</li> <li>3. Coulomb's law</li> </ul> </li> <li>d. Magnetic fields</li> <li>e. Magnetic materials</li> <li>f. Magnetic shielding</li> <li>g. Shapes of magnets</li> </ul>
1-7.	Describe the following: <ul style="list-style-type: none"> <li>a. Work</li> <li>b. Energy <ul style="list-style-type: none"> <li>1. Kinetic</li> <li>2. Potential</li> </ul> </li> </ul>
Change 1 A0002-3	

Example Background PPP Table

TABLE A0002. BASIC ELECTRICITY (BACKGROUND) - Continued	
ITEM NO.	KNOWLEDGE/SKILL
1-8.	Describe an electric field and its effect on: <ul style="list-style-type: none"> <li>a. Electric potential</li> <li>b. Electric potential difference</li> <li>c. Potential polarity</li> </ul>
1-9.	Describe the methods of generating electromotive force (EMF). <ul style="list-style-type: none"> <li>a. Friction</li> <li>b. Pressure</li> <li>c. Heat</li> <li>d. Light</li> <li>e. Magnetism</li> <li>f. Chemical action</li> </ul>
1-10.	Describe various types of cells and batteries, their construction features, specific gravity with respect to state or charge, and process utilized to generate EMF. <ul style="list-style-type: none"> <li>a. Voltaic cell</li> <li>b. Dry cell</li> <li>c. Lead-acid cell</li> <li>d. Nickel-cadium cell</li> </ul>
1-11.	Describe current flow, factors which affect current flow, and unit of measurement.
1-12.	Define electrical resistance and the factors which affect resistance.
1-13.	Describe construction features of resistors. <ul style="list-style-type: none"> <li>a. Carbon</li> <li>b. Wire-wound</li> <li>c. Tapped</li> <li>d. Sliding contact</li> <li>e. Potentiometers</li> </ul>
1-14.	Describe the color code method of identifying resistor values.
1-15.	Describe the operation of simple dc series circuits with respect to the following: <ul style="list-style-type: none"> <li>a. Current (I), Voltage (E), and Resistance (R) relationships <ul style="list-style-type: none"> <li>1. Ohm's law</li> <li>2. Kirchoff's voltage law</li> <li>3. Power determination</li> </ul> </li> <li>b. Circuit safety devices</li> </ul>
1-16.	Describe the operation of basic parallel dc circuits with respect to: <ul style="list-style-type: none"> <li>a. Kirchoff's current law</li> <li>b. Determination of equivalent resistance <ul style="list-style-type: none"> <li>1. Reciprocal method</li> <li>2. Product over the sum method</li> </ul> </li> <li>c. Determination of Power</li> </ul>

Change 1

A0002-4

### Example Background PPP Table - Continued

TABLE A0002. BASIC ELECTRICITY (BACKGROUND) - Continued	
ITEM NO.	KNOWLEDGE/SKILL
1-17.	Describe the operation of basic dc series parallel combination circuits, including bridge circuits.
1-18.	Describe circuit analysis of dc networks utilizing the following techniques: <ul style="list-style-type: none"> <li>a. Loop analysis using Kirchoff's voltage law</li> <li>b. Thevenin's theorem</li> <li>c. Norton's theorem</li> </ul>
1-19.	Describe the construction and operation of a simple alternator in terms of: <ul style="list-style-type: none"> <li>a. Induced voltage</li> <li>b. Complete cycle</li> </ul>
1-20.	Describe the characteristics of sine waves <ul style="list-style-type: none"> <li>a. Frequency</li> <li>b. Period</li> <li>c. Amplitude <ul style="list-style-type: none"> <li>1. Peak-to-peak</li> <li>2. RMS</li> <li>3. Instantaneous</li> <li>4. Average</li> <li>5. Effective</li> </ul> </li> <li>d. Phase</li> </ul>
1-21.	Describe sine wave phase relationships using vectors.
1-22.	Describe inductance (L) in terms of: <ul style="list-style-type: none"> <li>a. Faraday's law</li> <li>b. Left-hand rule</li> <li>c. Lenz's law</li> <li>d. Self inductance</li> <li>e. Mutual inductance</li> <li>f. Unit of inductance</li> </ul>
1-23.	Describe types of inductors. Include construction features and characteristics. <ul style="list-style-type: none"> <li>a. Iron core</li> <li>b. Air core</li> </ul>
1-24.	Describe determination of: <ul style="list-style-type: none"> <li>a. Mutual inductance</li> <li>b. Total inductance of series connected inductors</li> <li>c. Total inductance of parallel connected inductors</li> </ul>
1-25.	Describe current, voltage, and time relationships in series dc RL circuits. <ul style="list-style-type: none"> <li>a. Growth and decay curves</li> <li>b. Rate of change</li> <li>c. Universal time constant chart</li> </ul>
1-26.	Describe inductive reactance and phase relationships an inductive ac circuit.
Change 1 A0002-5	

Example Background PPP Table - Continued

TABLE A0002. BASIC ELECTRICITY (BACKGROUND) - Continued	
ITEM NO.	KNOWLEDGE/SKILL
1-27.	Describe transformers theory with respect to: <ul style="list-style-type: none"> <li>a. Primary</li> <li>b. Secondary</li> <li>c. Phase (polarity)</li> <li>d. Coefficient of coupling</li> <li>e. Turn ratios</li> </ul>
1-28.	Describe construction features of transformers. <ul style="list-style-type: none"> <li>a. Cores</li> <li>b. Windings</li> </ul>
1-29.	Describe electrical characteristics of transformers in terms of: <ul style="list-style-type: none"> <li>a. Effects of load <ul style="list-style-type: none"> <li>1. Mutual flux</li> <li>2. Current flux</li> <li>3. Power ratio</li> </ul> </li> <li>b. Losses <ul style="list-style-type: none"> <li>1. Copper</li> <li>2. Eddy currents</li> <li>3. Hysteresis</li> <li>4. Transformer efficiency</li> <li>5. Transformer rating</li> </ul> </li> </ul>
1-30.	Describe capacitance (C) in terms of the charging and discharging of a capacitor.
1-31.	Describe the various factors which affect capacitance. <ul style="list-style-type: none"> <li>a. Plate area</li> <li>b. Plate spacing</li> <li>c. Dielectric material</li> </ul>
1-32.	Describe various types of capacitors and their construction features. <ul style="list-style-type: none"> <li>a. Variable</li> <li>b. Fixed <ul style="list-style-type: none"> <li>1. Paper</li> <li>2. Mica</li> <li>3. Oil</li> <li>4. Ceramic</li> <li>5. Electrolytic</li> </ul> </li> </ul>
1-33.	Describe the color code method of identifying capacitor values.
1-34.	Describe determination of total capacitance of: <ul style="list-style-type: none"> <li>a. Series connected capacitance</li> <li>b. Parallel connected capacitance</li> <li>c. Combination capacitors circuits</li> </ul>
1-35.	Describe the current, voltage, and time relationships in series RC circuits. <ul style="list-style-type: none"> <li>a. Charging</li> <li>b. Discharging</li> <li>c. Time constants</li> </ul>

Change 1

A0002-6

### Example Background PPP Table - Continued

TABLE A0002. BASIC ELECTRICITY (BACKGROUND) - Continued	
ITEM NO.	KNOWLEDGE/SKILL
1-36.	Describe capacitance reactance and phase relationships in a capacitance ac circuit.
1-37.	Describe analysis of a series RL circuit using trigonometric functions. Include effect on the circuit form: <ul style="list-style-type: none"> <li>a. Frequency variations</li> <li>b. Resistance variations</li> <li>c. Inductance variations</li> </ul>
1-38.	Describe analysis of a series RC circuit using trigonometric functions. Include effect on the circuit form: <ul style="list-style-type: none"> <li>a. Frequency variations</li> <li>b. Resistance variations</li> <li>c. Capacitance variations</li> </ul>
1-39.	Describe frequency discrimination in series RL and RC circuits, including application in low- and high-pass filters.
1-40.	Describe determination of $Q$ and impedance in series RL and RC circuits.
1-41.	Describe the operation of series resonant circuits. Include the determination of: <ul style="list-style-type: none"> <li>a. Resonant frequency</li> <li>b. Circuit <math>Q</math></li> <li>c. Impedance</li> <li>d. Bandwidth</li> </ul>
1-42.	Describe analysis of a parallel RL circuit using trigonometric functions. Include effect on the circuit from: <ul style="list-style-type: none"> <li>a. Frequency variations</li> <li>b. Resistance variations</li> <li>c. Applied voltage variations</li> <li>d. High or low <math>Q</math> values</li> </ul>
1-43.	Describe analysis of a parallel RC circuit using trigonometric functions. Include effect on the circuit from: <ul style="list-style-type: none"> <li>a. Frequency variations</li> <li>b. Resistance variations</li> <li>c. Applied voltage variations</li> </ul>
1-44.	Describe operation of parallel resonant circuits. Include the determination of: <ul style="list-style-type: none"> <li>a. Resonant frequency</li> <li>b. Circuit <math>Q</math></li> <li>c. Impedance</li> <li>d. Bandwidth</li> </ul>
1-45.	Describe how RCL circuits can be utilized as simple phase shift networks.
<div>Change 1</div> <div>A0002-7</div>	

### Example Background PPP Table - Continued

TABLE A0002. <u>BASIC ELECTRICITY (BACKGROUND) - Continued</u>	
ITEM NO.	KNOWLEDGE/SKILL
1-46.	State the purpose of motors and generators in terms of energy conversion.
1-47.	Describe the construction features of basic motors and generators.
1-48.	Describe theory of operation of basic dc and ac motors using electromagnetic principles. Include description of: <ul style="list-style-type: none"> <li>a. Right-hand rule</li> <li>b. Torque</li> <li>c. Counter EMF</li> <li>d. Armature reaction</li> <li>e. No-load and full-load characteristics</li> </ul>
1-49.	Describe theory of operation of basic dc and ac generators using electromagnetic principles. Include description of: <ul style="list-style-type: none"> <li>a. Left-hand rule</li> <li>b. Armature reaction</li> <li>c. No-load and full-load devices</li> </ul>
1-50.	Describe the operation of ac and dc motors. <ul style="list-style-type: none"> <li>a. Motor types and applications</li> <li>b. Motor control circuits</li> <li>c. Braking and clutching devices</li> </ul>
1-51.	Describe the operation of ac and dc generators. <ul style="list-style-type: none"> <li>a. Generator types and applications</li> <li>b. Regulator and control circuits</li> </ul>
1-52.	Describe the principles and uses of basic dc electrical measuring devices. Include the application of shunts. <ul style="list-style-type: none"> <li>a. Galvanometer</li> <li>b. D'Arsonval meter</li> <li>c. DC ammeter</li> <li>d. DC voltmeter</li> <li>e. Ohmmeter</li> <li>f. Megger</li> </ul>
1-53.	Describe the principles and uses of basic ac electrical measuring devices. Include the application of shunts. <ul style="list-style-type: none"> <li>a. Moving iron-vane meter</li> <li>b. Rectifier type meter</li> <li>c. Electrodynamometer-type meter</li> <li>d. Thermocouple-type meter</li> <li>e. Wattmeter</li> </ul>
1-54.	Describe the effects of open or short circuits on the following circuits. <ul style="list-style-type: none"> <li>a. Series circuits (dc and ac)</li> <li>b. Parallel circuits (dc and ac)</li> </ul>
1-55.	Describe the common types and sizes of electrical wires and cables.
Change 1 <span style="float: right;">A0002-8</span>	

**Example Background PPP Table - Continued**



TABLE A0002. BASIC ELECTRICITY (BACKGROUND) - Continued	
ITEM NO.	KNOWLEDGE/SKILL
1-56.	Describe basic hand tools and procedures associated with maintenance of basic electrical circuits and devices such as soldering techniques and splices.
1-57.	Describe the purpose and utilization of schematic diagrams.
1-58.	Describe safety precautions which are to be observed when working with electrical circuits and Electrostatic Discharge (ESD) sensitive components, assemblies and equipment.
1-59.	Describe ESD sensitive components, assemblies, and equipment and associated problems.
1-60.	Describe the ESD control program.
1-61.	Describe the ESD protective materials and work area.
1-62.	Describe packaging, unpackaging, and inspection procedures for ESD sensitive components, assemblies, and equipments.
1-63.	Describe tools, test equipment, and maintenance procedures used for ESD protection.
1-64.	Describe ESD failure analysis techniques.
1-65.	Describe design considerations for ESD sensitive components, assemblies, and equipment.
1-66.	Describe the determination of current, voltage and impedance values in an ac circuit.
1-67.	Describe the determination of power values in an ac circuit. a. True power b. Reactive power c. Apparent power
1-68.	Describe the determination of the power factor of an ac circuit.
1-69.	Describe the analysis of series RLC circuits.
1-70.	Describe the analysis of parallel RLC circuits.
1-71.	Describe the principle of electromagnetism.
1-72.	Describe the general maintenance procedure for ac and dc motors and generators.
2.	SKILLS
2-1.	Use and interpret diagrams in conjunction with analyzing basic circuits.
2-2.	Diagnose common electrical faults.
Change 1 A0002-9	

Example Background PPP Table - Continued

TABLE A0002. BASIC ELECTRICITY (BACKGROUND) - Continued	
ITEM NO.	KNOWLEDGE/SKILL
2-3.	Use basic electrical measuring devices and interpret their indications.
2-4.	Use basic handtools.
2-5.	Operate motors and generators.
2-6.	Adhere to personnel and equipment safety precautions when working with ESD sensitive components, assemblies, and equipment, electrical circuits, and basic handtools.
2-7.	Identify resistor values using resistor color codes.
2-8.	Solve basic dc series, parallel, and series parallel combination circuits, including bridge circuits. <ul style="list-style-type: none"> <li>a. Current (I) Voltage (E) and Resistance (R) relationships <ul style="list-style-type: none"> <li>1. Ohm's law</li> <li>2. Kirchoff's voltage law</li> <li>3. Power determination</li> <li>4. Determination of equivalent resistance <ul style="list-style-type: none"> <li>(a) Reciprocal method</li> <li>(b) Product over the sum method</li> </ul> </li> </ul> </li> </ul>
2-9.	Determine equivalent dc networks utilizing the following techniques. <ul style="list-style-type: none"> <li>a. Loop analysis using Kirchoff's voltage law</li> <li>b. Thevenin's theorem</li> <li>c. Norton's theorem</li> </ul>
2-10.	Determine sine wave phase relationships using vectors.
2-11.	Determine the total inductance of series, parallel, and series parallel connected inductors.
2-12.	Solve current, voltage, and time relationships in dc RL circuits.
2-13.	Solve inductive reactance and phase relationships in an inductive ac circuit.
2-14.	Determine the current, voltage, and power relationship of a transformer with respect to: <ul style="list-style-type: none"> <li>a. Primary</li> <li>b. Secondary</li> <li>c. Phase (Polarity)</li> <li>d. Coefficient of coupling</li> <li>e. Turns ratio</li> </ul>
2-15.	Determine the current, voltage, and time relationships in series RC circuits. <ul style="list-style-type: none"> <li>a. Charging</li> <li>b. Discharging</li> <li>c. Time constants</li> </ul>
Change 1 A0002-10	

Example Background PPP Table - Continued

TABLE A0002. BASIC ELECTRICITY (BACKGROUND) - Continued	
ITEM NO.	KNOWLEDGE/SKILL
2-16.	Determine capacitance reactance and phase relationships in a capacitive ac circuit.
2-17.	Analyze a series RL circuit using trigonometric functions. Include effect on the circuit from: <ul style="list-style-type: none"> <li>a. Frequency variations</li> <li>b. Resistance variations</li> <li>c. Inductance variations</li> </ul>
2-18.	Analyze a series RC circuit using trigonometric functions. Include effect on the circuit from: <ul style="list-style-type: none"> <li>a. Frequency variations</li> <li>b. Resistance variations</li> <li>c. Capacitance variations</li> </ul>
2-19.	Determine $Q$ and impedance in series RL and RC circuits.
2-20.	Analyze a series resonant circuit. Include the determination of: <ul style="list-style-type: none"> <li>a. Resonant frequency</li> <li>b. Circuit <math>Q</math></li> <li>c. Impedance</li> <li>d. Bandwidth</li> </ul>
2-21.	Analyze a parallel RL, RC circuit using trigonometric functions. Include effect on the circuit from: <ul style="list-style-type: none"> <li>a. Frequency variations</li> <li>b. Resistance variations</li> <li>c. Applied voltage variations</li> <li>d. High or low <math>Q</math> values</li> </ul>
2-22.	Analyze a parallel resonant circuits. Include the determination of: <ul style="list-style-type: none"> <li>a. Resonant frequency</li> <li>b. Circuit <math>Q</math></li> <li>c. Impedance</li> <li>d. Bandwidth</li> </ul>
2-23.	Perform packaging, unpackaging, and inspection procedures for ESD sensitive components, assemblies, and equipment.
2-24.	Using appropriate protective materials, work area, and test equipment, perform maintenance procedures on ESD sensitive components, assemblies, and equipment.
2-25.	Determine the total capacitance of series, parallel, and series-parallel connected capacitors.
2-26.	Analyze a sine-wave to determine <ul style="list-style-type: none"> <li>a. Frequency</li> <li>b. Period</li> <li>c. Wavelength</li> <li>d. Peak value</li> <li>e. Peak-to-peak value</li> </ul>
Change 1 A0002-11	

Example Background PPP Table - Continued

TABLE A0002.      BASIC ELECTRICITY (BACKGROUND) - Continued	
ITEM NO.	KNOWLEDGE/SKILL
	f.    Instantaneous value g.    Average value h.    Effective value
2-27.	Determine current, voltage, and impedance values in an ac circuits.
2-28.	Determine power values in an ac circuit.
2-29.	Determine the power factor of an ac circuit.
2-30.	Analyze a series RLC circuit.
2-31.	Analyze a parallel RLC circuit.
<div>Change 1</div> <div>A0002-12</div>	

Example Background PPP Table - Continued

**TAB A-3**  
**TRAINING PATH SYSTEM**

**UNCLASSIFIED**

**TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)  
TRAINING PATH SYSTEM  
REPORT**

**August 1990**

**UNCLASSIFIED**

**Example TPS Report Cover Page**

**A-3-3**

## PERFORM TOS SET

### BG (BACKGROUND) SKILL/KNOWLEDGE TOS

#### S - Skill:

Completion of training provides the PREREQUISITE (Background), PHYSICAL or MENTAL Skills necessary to support follow-on training in PERFORMING the operation or maintenance of a system, subsystem, or equipment, a task/function, or further background training.

#### TO - Recognition/Recall:

Completion of training provides the knowledge required to identify (recognition) or remember (recall) specific terms, facts, rules, methods, principles, procedures, or objects.

### TO (TASK/FUNCTION) SKILL/KNOWLEDGE TOS

#### J - Skill:

Completion of training provides the PHYSICAL AND/OR MENTAL Skills required to PERFORM the job or function.

#### T4 - Knowledge:

Completion of training provides the knowledge required to support the performance of the skills required to perform the job or task/function.

## Example Perform TOS Set Statements

PERFORM TOS SET  
FAMILIARIZATION TOS

F1 - Knowledge:

Completion of training provides FAMILIARITY with the:

- Purpose, operational concepts, location, capabilities and limitations of a system/subsystem/equipment
- Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

Example Perform TOS Set Statements - Continued



## PERFORM TOS SET

### OPERATION/MAINTENANCE SKILL TOS

#### O1-Skill

Completion of training provides the skill to perform normal operations.

#### O2-Skill

Completion of training provides the skill to perform:

- Normal operations requiring advanced analysis
- Abnormal operations (defined as casualty/degraded/not full mission capable)

#### P1-Skill

Completion of training provides the skill to perform preventive maintenance.

#### C1-Skill

Completion of training provides the skill to perform to the authorized maintenance level, systematic fault isolation procedures.

#### C2-Skill

Completion of training provides the skill to perform to the authorized maintenance level:

- Systematic fault isolation procedures that require advanced analysis
- Authorized techniques to isolate faults that cannot be isolated using procedures contained in prescribed documentation

#### C3-Skill

Completion of training provides the skill and knowledge to perform, without supervision, diagnosis of equipment malfunctions, fault isolation, and all repairs (this skill is acquired through on-the-job experience, and reflects a continuous learning process that is supported by the skills and knowledge taught in the formal school environment).

PERFORM TOS SET

OPERATION/MAINTENANCE KNOWLEDGE TOS

T1-Knowledge

Completion of training provides the knowledge to perform normal operations:

- Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

T2-Knowledge

Completion of training provides the knowledge to perform:

- Normal operations requiring advanced analysis
- Abnormal operations (defined as casualty/degraded/not full mission capable)
- Preventive maintenance
- Basic corrective maintenance
- Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

T3-Knowledge

Completion of training provides the knowledge to perform advanced corrective maintenance:

- Organization, content, and use of the technical documentation provided for use with the system/subsystem/equipment

TRAINING LEVEL ASSIGNMENT FOR TRIDENT EXTERIOR COMMUNICATIONS SYSTEM  
(ECS) (NEC RM-23TA) POWER DISTRIBUTION GROUP (Equipment) TPS-RM-23TA

TABLE F0194

ITEM	LEVEL								
	F1	T1	T2	T3	O1	O2	P1	C1	C2
1-1-1		R							
1-1-2		R							
1-1-3		R	R						
1-1-4		R	R						
1-1-5		R	R						
1-1-6		R	R						
1-2-1		R	R						
1-2-2		R	R						
1-3-1		R	R						
1-3-2		R	R						
1-4-2		R	R						
1-5-1		R							
1-5-2a		R							
a(1)		R							
b		R							
c		R							
1-5-3		R							
1-5-5		R							
1-6-1a			R						
1-6-3			R						
1-6-11			R						
1-7-1		R							
2-1-1a					R				
	F1	T1	T2	T3	O1	O2	P1	C1	C2
5									

Example Perform Training Level Assignment

## TABLE F0194 (Continued)

**A-3-9**

TRAINING LEVEL ASSIGNMENT FOR TRIDENT EXTERIOR COMMUNICATIONS SYSTEM  
(ECS) (NEC RM-23TA) TOWED BOUY ANTENNA (Equipment) TPS-RM-23TA

TABLE F0202

ITEM	LEVEL								
	F1	T1	T2	T3	O1	O2	P1	C1	C2
1-1-1		R							
1-1-2		R							
1-1-3		R	R						
1-1-4		R	R						
1-1-5		R	R						
1-2-1		R	R						
1-2-2		R	R						
1-3-1		R	R						
1-3-2		R	R						
1-4-2a		R	R						
b		R	R						
c		R	R						
1-5-1		R							
1-5-2a		R							
a(1)		R							
b		R							
c		R							
1-5-3		R	R						
1-5-4			R						
1-5-5		R	R						
1-6-1a			R						
1-6-3			R						
1-6-11			R						
	F1	T1	T2	T3	O1	O2	P1	C1	C2
7									

Example Perform Training Level Assignment-Continued

TRAINING LEVEL ASSIGNMENT FOR TRIDENT EXTERIOR COMMUNICATIONS SYSTEM  
(ECS) (NEC RM-23TA) TOWED BOUY ANTENNA (Equipment) TPS-RM-23TA

TABLE F0202 (Continued)

ITEM	LEVEL								
	F1	T1	T2	T3	O1	O2	P1	C1	C2
1-7-1		R							
2-1-1a					R				
a(1)					R				
b					R				
c					R				
2-1-2					R	2			
2-1-3						2			
2-1-4					R	2			
2-2-2							R		
2-2-10							R		
	F1	T1	T2	T3	O1	O2	P1	C1	C2
8									

Example Perform Training Level Assignment-Continued

TRAINING LEVEL ASSIGNMENT FOR TRIDENT EXTERIOR COMMUNICATIONS SYSTEM  
(ECS) (NEC RM-23TA) DATA SWITCHING SUBSYSTEM TPS-RM-23TA

TABLE F0156

ITEM	LEVEL								
	F1	T1	T2	T3	O1	O2	P1	C1	C2
1-1-1		R							
1-1-2		R							
1-1-3		R	R						
1-1-4		R	R						
1-1-5		R	R						
1-2-1		R	R						
1-2-2		R	R						
1-3-1		R	R						
1-3-2		R	R						
1-4-2		R	R						
1-5-1		R	R						
1-5-2a		R							
a(1)		R							
b		R							
c		R							
1-5-3		R	R						
1-5-4			R						
1-5-6		R	R						
1-6-1a			R						
1-6-3			R						
1-6-11			R						
1-7-1		R							
2-1-1a					R				
	F1	T1	T2	T3	O1	O2	P1	C1	C2
9									

Example Perform Training Level Assignment-Continued

A-3-12

## TABLE F0156 (Continued)

A-3-13



TRAINING LEVEL ASSIGNMENT FOR TRIDENT EXTERIOR COMMUNICATIONS SYSTEM  
(ECS) (NEC RM-23TA) TPS-RM-23TA

TABLE F0147

ITEM	LEVEL								
	F1	T1	T2	T3	O1	O2	P1	C1	C2
1-1-1		R							
1-1-2a		R							
b		R							
c		R							
d		R							
e		R							
f		R							
g	R								
h		R							
i		R							
k		R							
1-1-3		R	R						
1-1-4		R	R						
1-1-5		R	R						
1-2-1a		R	R						
b		R	R						
c		R	R						
d		R							
e		R	R						
f		R	R						
g	R								
h		R	R						
i		R	R						
	F1	T1	T2	T3	O1	O2	P1	C1	C2
11									

Example Perform Training Level Assignment - Continued

TRAINING LEVEL ASSIGNMENT FOR TRIDENT EXTERIOR COMMUNICATIONS SYSTEM  
(ECS) (NEC RM-23TA) TPS-RM-23TA

TABLE F0147 (Continued)

ITEM	LEVEL								
	F1	T1	T2	T3	O1	O2	P1	C1	C2
1-2-2		R	R						
1-3-1		R	R						
1-3-2		R	R						
1-3-3		R	R						
1-4-2		R	R						
1-5-1		R	R						
1-5-2b		R							
1-5-3		R	R						
1-5-4			R						
1-5-6		R	R						
1-6-2				R					
1-6-3			R						
1-6-5				R					
1-6-6				R					
1-6-7			R						
1-6-8				R					
1-6-10				R					
1-6-11				R					
1-7-1		R							
2-1-1b					R				
2-1-2					R	R			
2-1-3		R	R			R			
	F1	T1	T2	T3	O1	O2	P1	C1	C2
12									

Example Perform Training Level Assignment-Continued

## TABLE F0147 (Continued)

A-3-16

TRAINING LEVEL ASSIGNMENT FOR TRIDENT EXTERIOR  
COMMUNICATIONS SYSTEM (ECS) SUBMARINE FUNDAMENTALS  
(Task/Function) (NEC RM-23TA) TPS-RM-23TA

TABLE B0076

ITEM	LEVEL			ITEM	LEVEL	
	J	T4			J	T4
1-1-1		R				
1-1-2		R				
1-1-3		R				
1-1-4		R				
1-2-1		R				
1-2-2		R				
1-2-3		R				
1-3-1		R				
1-3-2		R				
1-4-1		R				
2-1-1	R					
2-1-2	R					
2-1-3	R					
2-1-4	R					
2-2-1	R					
2-2-2	R					
2-2-3	R					
2-3-1	R					
2-3-2	R					
2-4-1	R					
	J	T4			J	T4

Example Perform Training Level Assignment-Continued

TRAINING LEVEL ASSIGNMENT FOR TRIDENT EXTERIOR  
COMMUNICATIONS SYSTEM (ECS) BASIC ELECTRICITY (Background)  
(NEC RM-23TA) TPS-RM-23TA

TABLE A0002			TABLE A0002			TABLE A0002		
ITEM	LEVEL		ITEM	LEVEL		ITEM	LEVEL	
	S	TO		S	TO		S	TO
1-1		R	1-24		R	1-47		R
1-2		R	1-25		R	1-48		R
1-3		R	1-26		R	1-49		R
1-4		R	1-27		R	1-50		R
1-5		R	1-28		R	1-51		R
1-6		R	1-29		R	1-52		R
1-7		R	1-30		R	1-53		R
1-8		R	1-31		R	1-54		R
1-9		R	1-32		R	1-55		R
1-10		R	1-33		R	1-56		R
1-11		R	1-34		R	1-57		R
1-12		R	1-35		R	1-58		R
1-13		R	1-36		R	1-59		R
1-14		R	1-37		R	1-60		R
1-15		R	1-38		R	1-61		R
1-16		R	1-39		R	1-62		R
1-17		R	1-40		R	1-63		R
1-18		R	1-41		R	1-64		R
1-19		R	1-42		R	1-65		R
1-20		R	1-43		R	1-66		R
1-21		R	1-44		R	1-67		R
1-22		R	1-45		R	1-68		R
1-23		R	1-46		R	1-69		R
	S	TO		S	TO		S	TO

Example Perform Training Level Assignment-Continued



TRAINING PATH CHART FOR THE OHIO CLASS SUBMARINE RADIOMAN  
(NFC RM 23 TA) TABLE ASSIGNMENT

PPP TABLE  
INDEX

F0147 - TRIDENT  
EXTERIOR COMMUNICATIONS  
SYSTEM (ECS)

F0156 - Data Switching  
Subsystem (DS8)

F0194 - Power  
Distribution Group

F0202 - Towed Buoy  
Antenna AN/BRF-6

REPLACEMENT CONVERSION TRAINING	
A-101-0168 TRIDENT Exterior Communications Subsystem (ECS) Level 1	
A0138 P1	*4A10 T1, T2, O1, O2
D0035 T1, T2, O1, O2, P1	*4A11 T1
D0048 T1, T2, O1, O2, P1	*4A12 T1
D0049 T1, O1	*4A16 T1, T2, O1, O2, P1
D1040 T1, O1	*4A17 T1, T2, O1, O2, P1
D1065 T1, O1	*4A18 T1, T2
D1707 T1, O1	*4A19 T1, T2, O1, O2
F0008 T1, T2, O1, O2	*4C02 T1, O1
F0032 T1, T2, O1, O2	*4C05 T1, T2, O1, O2
F0147 F1, T1, T2, T3, O1,	*4C06 T1, T2, O1, O2
*4A08 T1, T2, O1, O2	*4E T1, T2, O1, O2, P1
*4A09 T1, T2, O1, O2	*4E04 T1, T2, O1, O2, P1
A-100-007 Hydrostatic Discharge	
A0002 S(BG), B1, B2	
L-100-0016 AN/BRT-2 Special Communications Subsystem	
D1029 T1, O1	
A-101-0279 Submarine Electromagnetic Interface (EMI) Familiarization	
*B516 S(TD)	
A-101-0136 TRIDENT Special Communication Combined Maintenance	
D1029 T1, T2, O1, O2, P1, C1	
D1030 T1, T2, T3, O1, P1, C1, C2	
D1031 T1, T2, O1, P1, C1, C2	
D1033 T1, T2, T3, O1, P1, C1, C2	
D1034 T1, T2, T3, O1, P1, C1, C2	

BACKGROUND TRAINING	
A-060-0011 Basic Enlisted Submarine School	
PPP Table Numbers TED	
A-100-0089 Basic Electronics Rate Training	
A0001 S(BG), B1, B2, A0007 S(BG), B1, B2	
A0002 S(BD), B1, B2, B0024 S(TO), G1, G2	
A0003 S(BG), B1, B2	
A-101-0276 Submarine Radioman Class "A" School	
A0003 S(BG), B1, B2	D0518 T1, O1
A0007 S(BG), B1, B2	D0519 T1, O1
A0029 S(BG), B1, B2	D0521 T1, O1
A0230 S(BG), B1, B2	D0522 T1, O1
B0001 S(TO), G1, G2	D1031 T1
D0034 T1, O1	D1038 T1, O1
D0035 T1, O1	D1064 T1
D0036 T1, O1	D1065 T1, O1
D0037 T1, O1	*D1437 T1
D0038 T1, O1	*D1438 T1
D0043 T1, O1	*D1439 T1, O1
D0050 T1	*D2500, T1
D0510 T1, O1	*X0022, T1
D0517 T1	*Y0022, T1

Example Training Path Chart

**TAB A-4**

**TRAINING COURSE CONTROL DOCUMENT**



TRAINING COURSE CONTROL DOCUMENT  
FOR  
TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)  
A-111-4251

PREPARED FOR  
CHIEF OF NAVAL TECHNICAL TRAINING  
NAVAL AIR STATION MEMPHIS  
MILLINGTON, TENNESSEE 38054

PREPARED BY  
TRIDENT TRAINING FACILITY  
BANGOR, WASHINGTON 98315-5400

AUGUST 1991

\* \* \* \* \*

\* Note to developer: The Letter of Promulgation \*

\* will be added after the CCA has approved the \*

\* course for implementation. \*

\* \* \* \* \*

# TRAINING COURSE CONTROL DOCUMENT

## TABLE OF CONTENTS

<u>Contents</u>	<u>Page</u>
Letter of Promulgation.....	4
Foreword.....	7
Course Data.....	9
Trainee Data.....	11
Outline of Instruction.....	11
ANNEX A: Profile Item-to-Topic Objective Assignment Chart	
ANNEX B: Resource Requirements List	
ANNEX C: Course Master Schedule	
ANNEX D: Fault Applicability List	

## TRAINING COURSE CONTROL DOCUMENT

### Foreword

The TRIDENT Exterior Communication System (ECS) Basic Maintenance course is designed to provide the training necessary to perform selected preventive and documented corrective maintenance on the TRIDENT ECS Control Monitor and Test (CMT) Subsystem. In addition, training is provided in carrying out undocumented corrective maintenance on designed subsystem.

# TRAINING COURSE CONTROL DOCUMENT

## COURSE DATA

### Course Title:

TRIDENT Exterior Communications System (ECS)  
Control Monitor and Test (CMT) Subsystem

### Course Identification Number (CIN):

A-111-4251

### CDP: 1234

### Course Status:

This is a revision to the course developed Oct. 1976.

### Course Mission Statement:

The TRIDENT (ECS) CMT Basic Maintenance course is designed to provide the training necessary to documented preventive and corrective maintenance on the TRIDENT ECS Control Monitor and Test (CMT) Subsystem and undocumented corrective maintenance on selected CMT Subsystem equipments, under all conditions of readiness, in port or underway.

### Occupational Classification:

NEC 1234 is awarded to course graduates.

### Prerequisites

1. Rate: RM
2. Clearance: SECRET and CRYPTO NEED-TO-KNOW
3. Graduate of TRIDENT ECS Level I (A-101-0168) course, TRIDENT (ECS) Support Subsystem (A-101-0172) course, TRIDENT (ECS) ANT/AIS Subsystem (A-101-0173) course, TRIDENT (ECS) HF/UHF Subsystem (A-101-0175) course, TRIDENT (ECS) VLF/LF Subsystem (A-101-0170) course, and TRIDENT (ECS) DSS Subsystem (A-101-0171) course.

### Course Overview:

Perform selected preventive and documented corrective maintenance on the TRIDENT ECS Control Monitor and Test (CMT) Subsystem to include:

- Indicator Processor ID-2156/BSC-1

## TRAINING COURSE CONTROL DOCUMENT

### COURSE DATA (Continued)

- Antenna Deployment Indicator ID-2157/BSC-1
- Power Supply PP-7476/BSC-1
- Interface Unit J-3565/BSC-1 (Message Interface Unit)
- Controller Memory Unit C-10448/BSC-1
- Interface Unit J-3566/BSC-1 (Digital Interface Unit)
- Switching Unit SA-2204/BSC-1 (Mass Memory 2 Interface Unit)
- Interface Unit J-3568/BSC-1 (HSP/Magnetic Tape Unit Interface Unit)
- Recorder-Reproducer Control C-10447/BSC-1
- Recorder-Reproducer Unit RD-442/BSC-1
- Comparator CM-507/BSC-1
- Disc Memory Unit MU-674/BSC-1

#### Planned Course Length:

1. 72 Calendar Days
2. 45 Instructional Days

#### Current Course Length:

1. 52 Calendar Days
2. 38 Instructional Days

#### Training Sites:

1. TRIDENT Training Facility, Bangor, Silverdale Washington
2. TRIDENT Training Facility, Kings Bay, Georgia

#### Site Unique Training Considerations:

1. None

#### Number of Classes by Training Site:

#### Current:   Planned:

- |   |   |   |
|---|---|---|
| 1. TRIDENT Training Facility, Bangor    | 3 | 3 |
| 2. TRIDENT Training Facility, Kings Bay | 3 | 3 |

#### Class Capacity by Training Site:

#### Current:   Planned:

- |                                      |    |    |
|--------------------------------------|----|----|
| 1. TRIDENT Training Facility, Bangor |    |    |
| a.     Maximum:                      | 12 | 12 |
| b.     Minimum:                      | 8  | 8  |

## TRAINING COURSE CONTROL DOCUMENT

### COURSE DATA (Continued)

#### Class Capacity by Training Site:- Continued      Current:    Planned:

##### 2. TRIDENT Training Facility, Kings Bay

a.     Maximum:	12	12
b.     Minimum:	8	8

#### Planned Average Onboard by Training Site:      Current:    Planned:

1. TRIDENT Training Facility, Bangor	12	12
2. TRIDENT Training Facility, Kings Bay	12	12

#### Instructor/Support Manning by Site:

The estimated plan for instructor/support manning is based on the same ratios for all sites. Periods can be found on the Course Master Schedule.

	<u>Current:</u>	<u>Planned:</u>
1. TRIDENT Training Facility, Bangor	2	4
2. TRIDENT Training Facility, Kings Bay	2	4

TRAINING COURSE CONTROL DOCUMENT

TRAINEE DATA

Personnel Physical Requirements:

NONE

Security Clearance:

Clearance: SECRET and CRYPTO NEED-TO-KNOW

Obligated Service:

In accordance with the Enlisted Transfer Manual

NOBC/NEC Earned:

NEC 4201



**TRAINING COURSE CONTROL DOCUMENT**  
**CURRICULUM OUTLINE OF INSTRUCTION**

A-111-4251

**COURSE LEARNING OBJECTIVES**

Upon successful completion of this course, the trainees will have acquired the following knowledge and skills and be able to:

Knowledge:

1. Describe the theory necessary to support and understand the performance of normal and degraded operational tasks and all preventive maintenance without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the following:
  - a. TRIDENT Exterior Communications System (ECS)
  - b. Data Switching Subsystem (DSS)
  - c. Power Distribution Group
  - d. Towed Buoy Antenna AN/BRR-6
2. Describe the theory necessary to support and understand the performance of documented fault isolation and repair without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the following:

Skills:

1. Perform normal and degraded operational procedures with supervision on the following:
  - a. TRIDENT Exterior Communications System (ECS)
  - b. Data Switching Subsystem (DSS)
  - c. Power Distribution Group
  - d. Towed Buoy Antenna AN/BRR-6

NOTE TO THE READER. CLOs T1 and T2 have been combined into a single CLO, i.e., "normal and degraded"

2. Perform preventive maintenance procedures with supervision on the following:
  - a. TRIDENT Exterior Communications System (ECS)
  - b. Data Switching Subsystem (DSS)
  - c. Power Distribution Group
  - d. Towed Buoy Antenna AN/BRR-6

TRAINING COURSE CONTROL DOCUMENT  
CURRICULUM OUTLINE OF INSTRUCTION

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COURSE LEARNING OBJECTIVES - Continued.

Knowledge:

- a. PP-7474/BSC-1, PP-7475/BSC-1 Power Supplies
- b. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units

Skills:

- 3. Describe the theory necessary to support undocumented fault isolation and repair requiring advanced analysis without going into signal or electrical flow, computer instructions, or detailed mechanical component breakdown except for those mechanical or logic elements or circuits unique to the equipment or program of the Interface Unit J-3565/BSC-1 (Message Interface Unit).
- 3. Perform, with supervision, documented fault isolation and repair procedures to the authorized maintenance level on the following:
  - a. PP-7474/BSC-1, PP-7475/BSC-1 Power Supplies
  - b. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
- 4. Perform fault isolation and repair of faults that cannot be located using procedures contained in prescribed documentation or that require advanced analysis, with supervision, on the Interface Unit J-3565/BSC-1 (Message Interface Unit).

## TRAINING COURSE CONTROL DOCUMENT

PART F0147

PART F0147

### EXTERIOR COMMUNICATIONS SYSTEM (ECS) ECLECTIC SYSTEM

This part contains information from PPP Tables F0147, F0202, F0001, and F0002.

- Section 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP (T1, T2)
- Section 2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) (O1, O2)
- Section 3. PREVENTIVE MAINTENANCE OF THE TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS) (P1)
- Section 4. THEORY OF THE DATA SWITCHING SUBSYSTEM (DSS) (T1, T2)
- Section 5. BASIC CORRECTIVE MAINTENANCE OF THE SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 SWITCHING UNITS AND PP-7474/BSC-1, PP-7475/BSC-1 POWER SUPPLIES (C1)
- Section 6. THEORY OF AND ADVANCED THEORY OF THE INTERFACE UNIT J-3565/BSC-1 (MESSAGE INTERFACE UNIT) (KINGS BAY) (T2, T3)
- Section 7. PREVENTIVE, BASIC CORRECTIVE, AND CORRECTIVE MAINTENANCE OF THE OF THE INTERFACE UNIT J-3565/BSC-1 (MESSAGE INTERFACE UNIT) (P1, C1, C2)
- Section 8. THEORY OF THE TSEC/KY-58 (T1)
- Section 9. PREVENTIVE AND BASIC CORRECTIVE MAINTENANCE OF THE TSEC/KY-58 (P1, C1)

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Only certain pages of the Curriculum Outline of Instruction were used as examples, the other pages were intentionally omitted.

TRAINING COURSE CONTROL DOCUMENT  
CURRICULUM OUTLINE OF INSTRUCTION

A-111-4251

Section 1: INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP

<u>Topic No.</u>	<u>Topic Title</u>	<u>Page</u>
1	General and Documentation Description of the Power Distribution Group	F0147-1-1-1
2	General, Physical, Functional, and Interface Description of the AN/BRR-6	F0147-1-2-1
3	Operational Description of the DSS	F0147-1-3-1
4	Maintenance Description of the ECS	F0147-1-4-1

NOTE TO THE READER. The titles are inconsistent between the section and topics because a variety of topics were selected to present a broader sampling. Also, Topic No. 2 shows four topic titles combined into one topic, while the convention recommends not more than three be combined.

# **TRAINING COURSE CONTROL DOCUMENT** **CURRICULUM OUTLINE OF INSTRUCTION**

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP A-1111-4251

## **Topic 1: GENERAL AND DOCUMENTATION DESCRIPTION OF THE POWER DISTRIBUTION GROUP**

### **Topic Learning Objectives**

Upon successful completion of this topic, the trainee will be able to:

1. State the functions of the Power Distribution Group.
2. State that the Power Distribution Group consists of the following major functional areas. Include the function of each to support normal operations. (02, P1, T2)
  - a. Power panel
  - b. Power distribution black panel
  - c. Power distribution red panel
  - d. Component compartment
  - e. Ground fault indicator panel
4. State the operational characteristics and capabilities of the Power Distribution Group to support all operations and preventive maintenance. (02, P1, T2)
5. State the security requirements for the Power Distribution Group to support all operations and preventive maintenance. (02, P1)
6. Describe the organization, content, and use of all technical documentation provided for use with the Power Distribution Group to support normal operations. (01, T1)

Topic Learning Objectives (TLOs) should be in instructional sequence. This is usually the same as the PPP table line item sequence.

3. Define the abbreviations, terms, and symbols used with the Power Distribution Group to support all operations and preventive maintenance. (02, P1)

# **TRAINING COURSE CONTROL DOCUMENT** **CURRICULUM OUTLINE OF INSTRUCTION (Continued)**

## **1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP**

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### **Topic 2: GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6**

#### **Topic Learning Objectives**

Upon successful completion of this topic, the trainee will be able to:

1. State the functions of the AN/BRR-6. (F1)
2. State the major functions of AN/BRR-6 consisting of: Include the function of each to support normal operations. (F1)
  - a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)
  - b. Receiver Group OR-197/BRR-6
  - c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6
  - d. Buoy Cradle MT-4905/BRR-6
  - e. Reeling Machine RL-275/BRR-6
  - f. Sensor Group OA-8906/BRR-6
  - g. Buoy Door Sensing Switch
  - h. Buoy Control Indicator C-10256A/BRR-6
  - i. Antenna Control Indicator C-10257/BRR-6
  - j. Buoy Depth Control Indicator C-10258A/BRR-6
  - k. Relay Assembly RE-1115/BRR-6

1. Interconnecting Box J-3461/BRR-6
- m. Towed Array Control Indicator Panel

Subitems should appear exactly as they do on the PPP table.

3. Define the abbreviations and terms used with the AN/BRR-6 to support all operations and preventive maintenance. (02,P1,T2)
4. State the operational characteristics and capabilities of the AN/BRR-6 to support all operations and preventive maintenance. (02,P1,T2)
5. State the security requirements for the AN/BRR-6 to support all operations and preventive maintenance. (02,P1,T2)

# **TRAINING COURSE CONTROL DOCUMENT** **CURRICULUM OUTLINE OF INSTRUCTION (Continued)**

## **1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP**

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6. Describe all major and associated components of the AN/BRR-6 to support all operations and preventive maintenance. Include names, nomenclature, physical appearance, reference designers, locations, and construction features. (02,P1,T2)

The TB-18A/BRR-6 and EE126-FA-MMF-010/E110-BRR-6 are fictitious and used for illustration purposes only.

- a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)
- b. Receiver Group OR-197/BRR-6
- c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6
- d. Buoy Cradle MT-4905/BRR-6
- e. Reeling Machine RL-275/BRR-6
- f. Sensor Group OA-8906/BRR-6
- g. Buoy Door Sensing Switch
- h. Buoy Control Indicator C-10256A/BRR-6
- i. Antenna Control Indicator C-10257/BRR-6
- j. Buoy Depth Control Indicator C-10258A/BRR-6
- k. Relay Assembly RE-1115/BRR-6
- l. Interconnecting Box J-3461/BRR-6
- m. Towed Array Control Indicator Panel

7. Describe the controls and indicators directly associated with the AN/BRR-6 to support all operations and preventive maintenance. Include names, reference-designators positions, conditions, colors, locations, and functions. (P1,T2)

TLOs should contain only those "include" statements that are applicable to the subject matter and TOS level being covered (e.g., construction features may not be applicable to every physical description topic).

8. Describe how the AN/BRR-6 works (functional operation) to support all operations and preventive maintenance. Include signal flow, sequential operation, and indications. (02,P1,T2)

- a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)

**TRAINING COURSE CONTROL DOCUMENT**  
**CURRICULUM OUTLINE OF INSTRUCTION (Continued)**

A-111-4251

**1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP**

- b. Receiver Group OR-197/BRR-6
- c. Special Purpose Electrical Cable Assembly  
CX-13053/BRR-6
- d. Buoy Cradle MT-4905/BRR-6
- e. Reeling Machine RL-275/BRR-6
- f. Sensor Group OA-8906/BRR-6
- g. Buoy Door Sensing Switch
- h. Buoy Control Indicator C-10256A/BRR-6
- i. Antenna Control Indicator C-10257/BRR-6
- j. Buoy Depth Control Indicator  
C-10258A/BRR-6
- k. Relay Assembly RE-1115/BRR-6
- l. Interconnecting Box J-3461/BRR-6
- m. Towed Array Control Indicator Panel

9. Describe the functional interface between the AN/BRR-6 and related external equipments to support all operations and preventive maintenance. (02,P1,T2)

- a. Power sources
- b. Input signals
- c. Output signals



# **TRAINING COURSE CONTROL DOCUMENT** **CURRICULUM OUTLINE OF INSTRUCTION (Continued)**

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## **1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP**

### **Topic 3: OPERATIONAL DESCRIPTION OF THE DSS**

#### **Topic Learning Objectives**

Upon successful completion of this topic, the trainee will be able to:

1. Describe the authority and regulations pertaining to normal operation of the following equipment, including external equipments which interface with them. (01,T1)

- a. TSEC/KG-84C
- b. TSEC/KG-36
- c. TSEC/KWR-46
- d. TSEC/KY-75
- e. TSEC/KY-58

2. Describe the authority and regulations pertaining to all operations of the DSS and the following equipment, including external equipments which interface with them. (02,T2)

- a. SA-2199/BSC-1, SA-2200/BSC-1,  
SA-2201/BSC-1 Switching Units
- b. Signal Data Converter CV-3510B/UG3.

3. Describe the routine preoperational, operational, and post operational tasks for normal operation of the DSS and the following equipment. (01,T1)

- a. SA-2199/BSC-1, SA-2200/BSC-1,  
SA-2201/BSC-1 Switching Units
- b. Signal Data Converter CV-3510B/UG

- c. TSEC/KG-84C
- d. TSEC/KG-36
- e. TSEC/KWR-46
- f. TSEC/KY-75
- g. TSEC/KY-58

4. Describe indications which may occur during normal operation of the DSS and the following equipment. Include alarms, indicators, and displays. (01,T1)

- a. TSEC/KG-84C
- b. TSEC/KG-36

# TRAINING COURSE CONTROL DOCUMENT CURRICULUM OUTLINE OF INSTRUCTION (Continued)

## 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP

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- c. TSEC/KWR-46
- d. TSEC/KY-75
- e. TSEC/KY-58
- 5. Describe indications which may occur during all operations of the DSS and the following equipment. Include alarms, indicators, and displays. (02,T2)
  - a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
  - b. Signal Data Converter CV-3510B/UG
- 6. Describe casualty/degraded/abnormal modes of operation for the DSS and the following equipment. (02,T2)
  - a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
  - b. Signal Data Converter CV-3510B/UG
- 7. Describe personnel and equipment safety precautions which are to be observed during normal operation of the DSS and the following equipment. (01,T1)
  - a. TSEC/KG-84C
  - b. TSEC/KG-36
  - c. TSEC/KWR-46
  - d. TSEC/KY-75
  - e. TSEC/KY-58
- 8. Describe personnel and equipment safety precautions which are to be observed during all operations of the DSS and the following equipment. (02,T2)
  - a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
  - b. Signal Data Converter CV-3510B/UG

# **TRAINING COURSE CONTROL DOCUMENT** **CURRICULUM OUTLINE OF INSTRUCTION (Continued)**

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP A-111-4251

## **Topic 4: MAINTENANCE DESCRIPTION OF THE ECS**

### **Topic Learning Objectives**

Upon successful completion of this topic, the trainee will be able to:

1. Define the maintenance policy for the ECS and the following subsystems and equipment required to support preventive maintenance as the requirement for periodic performance of tasks to minimize equipment malfunctions. Including: Servicing scheduled or unscheduled inspections, cleaning, lubrication, corrosion control and any other function in support of maintaining and equipment full mission capable; and Operational checks (confidence or performance checks, and Degradation/deterioration checks). (P1,T2)
  - a. Control, Monitor, and Test (CMT) Subsystem
    - (1) Interface Unit J-3565/BSC-1 (Message Interface Unit)
    - (2) Interface Unit J-3566/BSC-1 (Digital Interface Unit Interface)
    - (3) Interface Unit J-3568/BSC-1 (HSP/Magnetic Tape Unit Interface Unit)
    - (4) Recorder-Reproducer Control C-10447/BSC-1
    - (5) Recorder-Reproducer Unit RD-442/BSC-1
    - (6) Comparator CM-507/BSC-1

- b. Data Switching Subsystem (DSS)
  - (1) SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
- c. Very Low Frequency/Low Frequency (VLF/LF) Subsystem
  - (2) Signal Data Converter CV-3510B/UG
  - (1) Radio Receiver R-2109/BSC-1
  - (2) Radio Receiver R-2320/URR
  - (3) Digital Data Processor CP-1071B/WR
  - (4) Digital Data Demodulator MD-1191/WRR-7B
  - (5) Electrical Equipment Enclosure CY-8410/WRR-7B
  - (6) Power Supply PP-8098/BSC-1
- d. High Frequency/Ultra High Frequency (HF/UHF) Subsystem
  - (1) Radio Receiver-Transmitter RT-1107(V)12/WSC-3(V)
  - (2) Voice Switch Unit Control C-10975
  - (3) Command Center Telephone Terminal
- e. Support Subsystem
  - (1) Teleprinter TT-624/UG

**TRAINING COURSE CONTROL DOCUMENT**  
**CURRICULUM OUTLINE OF INSTRUCTION (Continued)**

A-111-4251

**1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP**

- (2) Power Distribution Group
- (3) Audio Tape Recorder CMS 1022
- (4) AN/BSC-1 Electronic Equipment Air Coolers

**f. Antenna Suite**

- (1) Multifunction Mast Antenna Group  
OE-207/BR
- (2) Towed Buoy Antenna AN/BRR-62.

2. Describe preventive maintenance procedures for the ECS and the subsystems and equipment listed in learning objective 1. Include recognition and interpretation of indications, records, reports, and instructions. (Pl,Tl)

3. Describe personnel and equipment safety precautions, including tag-out procedures, which are to be observed while performing preventive maintenance on the ECS and the subsystems and equipment listed in learning objective 1. (Pl,T2)

Where ten or more sub-items exist for a series of TLOs, it is permissible to have the listing appear in the first TLO only. Then, refer back to that learning objective in the remaining TLOs.

# **TRAINING COURSE CONTROL DOCUMENT** **CURRICULUM OUTLINE OF INSTRUCTION (Continued)**

2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) A-111-4251

Topic 1: Basic Operation and Operation of the DSS

## **Topic Learning Objectives**

Upon successful completion of this topic, the trainee will be able to:

1. Perform routine preoperational, operational, and post-operational tasks for normal operation of the DSS and the following equipment. (P1,T1)

- a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
- b. Signal Data Converter CV-3510B/UG
- c. TSEC/KG-84C
- d. TSEC/KG-36
- e. TSEC/KWR-46
- f. TSEC/KY-75
- g. TSEC/KY-58

2. Recognize and interpret all indications occurring during the performance of normal operating procedures, and perform appropriate operator actions in proper sequence on the DSS and the following equipment. (O1,T1)

- a. TSEC/KG-84C
- b. TSEC/KG-36
- c. TSEC/KG-46
- d. TSEC/KY-75
- e. TSEC/KY-58

3. Recognize and interpret all indications occurring during the performance of all operating procedures, and perform appropriate operator actions in proper sequence on the DSS and the following equipment. (O2,T2)

- a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units

- b. Signal Data Converter CV-3510B/UG

4. Perform operational tasks in the casualty/degraded/abnormal modes of operation of the DSS and the following equipment. (O2,T2)

- a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units

- b. Signal Data Converter CV-3510B/UG  
Adhere to personnel and equipment safety precautions during normal operational procedures of the DSS and the following equipment. (O1,T1)

- a. TSEC/KG-84C
- b. TSEC/KG-36

**TRAINING COURSE CONTROL DOCUMENT**  
**CURRICULUM OUTLINE OF INSTRUCTION (Continued)**

A-111-4251

**2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS)**

- c. TSEC/KG-46
- d. TSEC/KY-75
- e. TSEC/KY-58

6. Adhere to personnel and equipment safety precautions during all operational procedures of the DSS and the following equipment.  
(T2,O2)

- a. SA-2199/BSC-1, SA-2200/BSC-1,  
SA-2201/BSC-1 Switching Units

- b. Signal Data Converter CV-3510B/UG

Perform Preventive Maintenance Procedures for the ECS and the subsystem and equipment listed in the maintenance description, TLO #1.

Adhere to personnel and equipment safety precautions while performing preventive maintenance procedures on all the subsystems and equipment listed in the maintenance description TLO #1.

**ANNEX A**

**PROFILE ITEM-TO-TOPIC  
OBJECTIVE ASSIGNMENT CHART**

# TRAINING COURSE CONTROL DOCUMENT

A-111-4251A VOLUME 3

## PROFILE ITEM-TO-TOPIC OBJECTIVE ASSIGNMENT CHART

TABLE	ITEM	TOS	VOL	PART	SECT	TOPIC	L.O.	TEST ITEM NO.
F0147	1-1-3	T1	1	4	6	1	1	
	1-5-1	T1			1	3	1	
	1-5-1	T2			1	3	1	
	1-5-2	T1			1	3	2	
	a(1)	T1			1	3	2	
<div> <p>To reduce the amount of "ripple" when updating the OAC, start each new PPP table at the top of the next column.</p> </div>								
<div> <p>The volume number should appear in the first entry of each page. Otherwise, it only appears when it changes.</p> </div>								

TABLE	ITEM	TOS	VOL	PART	SECT	TOPIC	L.O.	TEST ITEM NO.
F0147	1-5-3	T1	1	4	1	3	2	
Cont.	1-5-3	T2			1	3	2	
	1-5-4	T2			1	3	2	
	1-5-6	T1			1	3	2	
	1-5-6	T2			1	3	2	
	1-6-8	T3			6	3	4	
	1-6-10	T3			6	3	6	
	1-6-11	T3			6	3	7	
	1-7-1	T2			6	1	3	
	2-1-1	O1	2		2	3	1	
	a	O1			2	3	1	
	a(1)	O1			2	1	1	

ANNEX A (1)



PROFILE ITEM-TO-TOPIC OBJECTIVE ASSIGNMENT CHART - Continued

TABLE	ITEM	TOS	VOL	PART	SECT	TOPIC	L.O.	TEST ITEM NO.
F0147 Cont.	2-1-1 Cont.							
	b	01	2		2	1	1	
	c	01			2	1	1	
	2-1-2	01			2	1	2	
	2-1-2	02			2	1	2	
	2-1-3	01			2	1	3	
	2-1-5	01			2	1	4	
	2-1-5	02			2	1	4	

TABLE	ITEM	TOS	VOL	PART	SECT	TOPIC	L.O.	TEST ITEM NO.
This is not a complete OAC. It is provided for illustration purposes only.								
The part number only appears when it is different than the PPP table number.								

**ANNEX B**

**RESOURCE REQUIREMENTS LIST**

# TRAINING COURSE CONTROL DOCUMENT

A-111-4251

## RESOURCE REQUIREMENTS LIST

COURSE: TRIDENT Exterior Communications System (ECS)

CLASS SIZE: As per the Formal Schools Catalog

### A. Texts

<u>Doc. No.</u>	<u>Title</u>	<u>Per Tr.</u>	<u>Per Inst.</u>	<u>Per Cl.</u>
A-111-4251	TRIDENT Exterior Communications System (ECS) Model Curricula Lesson Plan. Prepared by Chief of Naval Technical Training.		1	
A-111-4251	TRIDENT Exterior Communications System (ECS) Model Curricula Maintenance Trainee Guide. Prepared by Chief of Naval Technical Training.	1	1	

### B. References

<u>Doc. No.</u>	<u>Title</u>	<u>Per Tr.</u>	<u>Per Inst.</u>	<u>Per Cl.</u>
CNETINST 1500.20 series	Safety Policy and Procedures for Conducting Training		1	
CNTECHTRAINST 5100.5 series	Equipment Tag-out Procedures		1	

(1)

TRAINING COURSE CONTROL DOCUMENT

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RESOURCE REQUIREMENTS LIST - Continued.

<u>Doc. No.</u>	<u>Title</u>	<u>Per Tr.</u>	<u>Per Inst.</u>	<u>Per Cl.</u>
CNTECHTRA-ST1 Vol. 21	Integrated Radio Room AN/BSC-1 Fault Insertion Guide for TRIDENT Training Facility		1	
CSP-1 series	Cryptographic Security Policy and Procedures (U)		1	
COMSUBLANTINST 5101.2 series	Equipment Tag-out Procedures (Kings Bay)		1	
COMSUBPACINST 5101.4 series	Equipment Tag-out Procedures (Bangor)		1	
COMSUBPAC/ COMSUBLANTINST 5400.38 series	Standard Submarine Organization and Regulations Manual			
EE109-AJ-MMO-010/ W153-PDG	Power Distribution Group OP-118/BSC-1 Operation and Maintenance Instructions	1	1	
EE109-AL-MMO-010/ W153-DSS	Data Switching Subsystem Operation and Maintenance Instructions, Volume 1	1	1	
EE125-FA-MMF-010/ E110-BRR-6	FOMM Technical Manual Support Volume for Radio Receiving Set AN/BRR-6, Volume 1	1	1	
NAVSEA S9SSB-X9- SSM-84E/(U)726 V6P3B7E-1	Exterior Communications System - Normal Operating Procedures	1	1	(2)

# TRAINING COURSE CONTROL DOCUMENT

A-111-4251

## RESOURCE REQUIREMENTS LIST - Continued.

C.	Equipment	Item No.	Nomenclature	Part No.	Unit Cost	FSCM	Tech. Ref.	Per Tr.	Per Inst.	Per Cl.
1.	AN/BSC-1 Trainer						NAVSEA S8200-BG-PLN -010/LCSP(OP) TTF Or NAVSEA S8200-KB-PLN -010/LCSP(OP) TTF			1
2.	Board extractor tool			8784656-1						1
3.	Data acquisition probe lead set			012-0747-00						1
4.	Data Acquisition Probes Tektronix P6451			010-6451-02						1
5.	Digital Multimeter,			Fluke Model 8600A-01			SCIN/SCAT 4212			2
6.	NAVSEA Form 9210/9 (Danger/Caution Tag-Out Record Sheet)									12
7.	NAVSHIPS Form 9890/5 (Caution Tag)									12
8.	NAVSHIPS Form 9890/6 (Out of Calibration Sticker)									12
										(3)

TRAINING COURSE CONTROL DOCUMENT

A-111-4251

RESOURCE REQUIREMENTS LIST - Continued.

<u>Item No.</u>	<u>Nomenclature</u>	<u>Part No.</u>	<u>Unit Cost</u>	<u>FSCM</u>	<u>Tech. Ref.</u>	<u>Per Tr.</u>	<u>Per Inst.</u>	<u>Per Cl.</u>
9.	Prefaulted Module	8560392	(Fault No. 4X01-P-010)					1
10.	Prefaulted Module	8560399	(Fault No. 4X01-P-017)					1
11.	Prefaulted Module	61443PFM047	(Fault No. 4X01-P-023)					1
12.	SUBGEN Form 9890/31 (Index/Audit Record)							1

D. Films/Videotapes/Videodiscs

<u>Designator</u>	<u>Title</u>	<u>Running Time</u>	<u>Per Cl.</u>
None			

E. Graphics

Transparencies are A-111-4251 series.

(4)

# TRAINING COURSE CONTROL DOCUMENT

A-111-4251

## RESOURCE REQUIREMENTS LIST - Continued.

### 1. Transparencies

<u>Transparency No.</u>	<u>Title</u>	<u>Per Cl.</u>	<u>Source</u>	<u>Figure No.</u>
4X-1-3-1	Radio Room Status	1	EE109-AA-MMO-010/ W153-BSC1	5-2
4X-1-3-2	Power Status	1	Original Transparency prepared by SPAWAR 153-1L	
4X-4-4-2	(Deleted)			
4X-4-4-3	Power Supply PP-7474/BSC-1 Functional Interface (Bangor)	1	Original Transparency prepared by SPAWAR 153-1L	

2. Wall Charts. The wall charts for this course are full-sized photocopies of Communications Central AN/BSC-1 equipment racks. The wall chart numbers were determined based on the first time the wall chart was used in the TRIDENT Radioman pipeline. For example, the number A-101-0168-4-5 indicates that the Rack A5 wall chart was first used in the TRIDENT ECS Level I course, it relates to PPP Table 4, and it is the fifth wall chart associated with that PPP table.

### Wall Chart

<u>No.</u>	<u>Title</u>	<u>Per Cl.</u>	<u>Source</u>	<u>Figure No.</u>
A-101-0168-4-1	Antenna Control Group OK-371/BSC-1	1	Original Wall Chart prepared by SPAWAR 153-1L	
A-101-0168-4-5	Interconnecting Group ON-165/BSC-1	1	Original Wall Chart prepared by SPAWAR 153-1L	(5)

RESOURCE REQUIREMENTS LIST - Continued.

F. Support materials

Instruction Sheets. All instruction sheets (i.e., Assignment Sheets, Job Sheets, etc.) are A-111-4251 series.

Identification No.	Instruction Sheet Type	Title	Per Tr.	Per Inst.	Per Cl.
-----------------------	---------------------------	-------	---------	-----------	---------

(All instruction sheets for this course are contained within Trainee Guide A-111-4251.)

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**ANNEX C**

**COURSE MASTER SCHEDULE**

# TRAINING COURSE CONTROL DOCUMENT

A-111-4251

## COURSE MASTER SCHEDULE

A-111-4251

### WEEK 1

Length of Period: 50 minutes

#### Day 1

Topic No.	Type	Period	Topic	Ratio
F0147.1.1	Class	1	General and Documentation description of the Power Distribution Group	25:1
F0147.1.2	Class	2	General, Physical, Functional and Interface description of AN/BRR-6	25:1
F0147.1.2	Class	3	Same	25:1
F0147.1.2	Class	4	Same	25:1

Only Part F0147, Sections 1 and 2 are used as examples in Volume II. The others are intentionally omitted.

### WEEK 3

#### Day 1

Topic No.	Type	Period	Topic	Ratio
F0147.1	Test	81	Power Distribution Group	25:1
F0147.2.1	Class	82	Basic operation of the DSS	25:1
F0147.2.1	Lab	11	Same	10:1

ANNEX C (18)

**ANNEX D**  
**FAULT APPLICABILITY LIST**

TRAINING COURSE CONTROL DOCUMENT

A-111-4251

FAULT APPLICABILITY LIST

PART	SECT	TOS	EQUIPMENT	FUNCTION FAULTED	FAULT NO.	DOCUMENT
F0147	4	C1	SA-2199/BSC-1	DC Power	F104701-P-010*	CENTECHTRA-ST1, VOL. 21
F0147	4	C1	SA-2200/BSC-1	Control Matrix	F104701-P-017*	CENTECHTRA-ST1, VOL. 21
F0147	4	C1	SA-2200/BSC-1	Interlock Reset	F104701-P-023*	CENTECHTRA-ST1, VOL. 21
F0147	4	C1	SA-2201/BSC-1	SSI Monitoring	F104701-X-002A*	CENTECHTRA-ST1, VOL. 21
F0147	4	C1	SA-2199/BSC-1	SSI Monitoring	F104701-X-003A*	CENTECHTRA-ST1, VOL. 21
F0147	7	C1/C2	J-3265/BSC-1	SSIXS Message Display	F104702-P-011	CENTECHTRA-ST1, VOL. 21
F0147	7	C1/C2	J-3265/BSC-1	ODT to NTDS	F104702-P-013	CENTECHTRA-ST1, VOL. 21
F0147	7	C1/C2	J-3265/BSC-1	150 HzA	F104702-P-014	CENTECHTRA-ST1, VOL. 21
F0147	7	C1/C2	J-3265/BSC-1	Transition Detected Signal	F104702-P-015	CENTECHTRA-ST1, VOL. 21

- NOTE 1: The PART and SECT columns indicate the most appropriate location within the curriculum to use the fault.
- NOTE 2: The asterisk in the Fault No. column indicates that this fault is required for use in the curriculum.
- NOTE 3: Faults approved for dual use (C1 as C2) are noted in the TOS column.

ANNEX D (19)

**TAB A-5**  
**LESSON PLAN**

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

LESSON PLAN

July 1992

PUBLISHED BY DIRECTION OF THE CHIEF OF NAVAL TECHNICAL TRAINING

# LESSON PLAN

A-111-4251 REV A

## LIST OF EFFECTIVE PAGES

Volume/revision/change identification is shown for illustration purposes only.

Page No.	Change in Effect	Page No.	Change in Effect	Page No.	Change in Effect
Cover, ii, iia, Letter of Promulgation	Change 1	F0147-2-1-1 thru F0147-2-1-10	Original	F0147-4-4-9, F0147-4-4-10	Original
iv	Original	F0147-3-1 F0147-3-2	Original	F0147-4-5-1 thru F0147-4-5-16	Original
v thru xxiv	Change 1	F0147-3-1-1 thru F0147-3-1-14	Original	F0147-5-1, F0147-5-2	Original
Tab Part F0147	Original	F0147-4-1 F0147-4-2	Original	F0147-5-1-1 thru F0147-5-1-12	Original
F0147-1-1-2 F0147-1-2	Change 1	F0147-4-1-1 thru F0147-4-1-10	Original	F0147-6-1, F0147-6-2	Original
F0147-1-1-1 thru F0147-1-1-8	Original	F0147-4-2-1 thru F0147-4-2-12	Original	F0147-6-1-1 thru F0147-6-1-4	Original
F0147-1-2-1 thru F0147-1-2-20	Original	F0147-4-3-1 thru F0147-4-3-16	Original	F0147-6-2-1 thru F0147-6-2-14	Original
F0147-1-3-1 thru F0147-1-3-20	Original	F0147-4-4-1, F0147-4-4-2	Change 1	F0147-6-3-1 thru F0147-6-3-4	Original
F0147-1-4-1 thru F0147-1-4-22	Original	F0147-4-4-3 thru F0147-4-4-6	Original	F0147-6-4-1 thru F0147-6-4-9	Original
F0147-2-1 F0147-2-2	Original	F0147-4-4-7, F0147-4-4-8	Change 1	F0147-6-4-10	Change 1

# LESSON PLAN

A-111-4251 REV A

## LIST OF EFFECTIVE PAGES - Continued.

Page No.	Change in Effect	Page No.	Change in Effect	Page No.	Change in Effect
F0147-6-4-11 thru F0147-6-4-16	Deleted				
F0147-6-4-17, F0147-6-4-18	Original				
F0147-7-1, F0147-7-2	Original				
F0147-7-1-1 thru F0147-7-1-8	Original				
F0147-8-1, F0147-8-2	Original				
F0147-8-1-1 thru F0147-8-1-20	Original				
F0147-9-1, F0147-9-2	Original				
F0147-9-1-1 thru F0147-9-1-10	Original				
(1) thru (13)	Original				
(14)	Change 1				
(15) thru (24)	Original				

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Reserved for  
Letter of Promulgation

# LESSON PLAN

A-111-4251 REV A

## CHANGE RECORD

Number and Description of Change	Entered by	Date
1 To incorporate examples of change markings.	RM 1 C. Developer	8/15/90
<div data-bbox="488 947 597 1797" style="border: 1px solid black; padding: 5px;">                     This Lesson Plan was printed with Change 1 incorporated. Technical changes would be added by the instructor and noted on this page.                 </div>		

# LESSON PLAN

A-111-4251 REV A

## TABLE OF CONTENTS

FRONT MATTER		
Title.....	Page	
List of Effective Pages.....	i	
Letter of Promulgation.....	ii	
Change Record.....	iv	
Security Awareness Notice.....	v	
Safety/Hazard Awareness Notice.....	ix	
How to Use the Lesson Plan.....	x	
Course Master Schedule.....	xii	
Course Learning Objectives.....	xviii	
PART F0147 EXTERIOR COMMUNICATIONS SUBSYSTEM (ECS) ECLECTIC SYSTEM		
Section		
1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP.....	F0147-1-1	
1. General and Documentation Description of the Power Distribution Group.....	F0147-1-1-1	
2. General, Physical, Functional, and Interface Description of the AN/BRR-6.....	F0147-1-2-1	
<div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> This example contains only a portion of the entire Lesson Plan prepared for this course. </div>		
3. Operational Description of the DSS.....	F0147-1-3-1	
4. Maintenance Description of the ECS.....	F0147-1-4-1	
2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SYSTEM (DSS).....		
1. Basic Operation and Operation of the DSS.....	F0147-2-1	
3. PREVENTIVE MAINTENANCE OF THE TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS).....		
1. Preventive Maintenance of the ECS.....	F0147-3-1	
4. THEORY OF THE DATA SWITCHING SUBSYSTEM (DSS).....		
1. General Description of the DSS.....	F0147-4-1	

# LESSON PLAN

A-111-4251 REV A

## TABLE OF CONTENTS - Continued.

	Page		Page
2. Physical and Functional Description of the DSS.....	F0147-4-2-1	6. THEORY OF AND ADVANCED THEORY OF THE INTERFACE UNIT J-3565/BSC-1 (MESSAGE INTERFACE UNIT) (KINGS BAY).....	F0147-6-1
3. General, Physical, and Functional Description of the Switching Units and Power Supplies.....	F0147-4-3-1	1. General Description of the Message Interface Unit.....	F0147-6-1-1
4. Interface Description of the Switching Units and Power Supplies.....	F0147-4-4-1	2. Physical and Functional Description of the Message Interface Unit....	F0147-6-2-1
5. Maintenance Description of the Switching Units and Power Supplies.....	F0147-4-5-1	3. Interface Description of the Message Interface Unit.....	F0147-6-3-1
5. BASIC CORRECTIVE MAINTENANCE OF THE SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 SWITCHING UNITS AND PP-7474/BSC-1, PP-7475/BSC-1 POWER SUPPLIES.....	F0147-5-1	4. Maintenance Description of the Message Interface Unit.....	F0147-6-4-1
1. Basic Corrective Maintenance of the Switching Units and Power Supplies.....	F0147-5-1-1		

# LESSON PLAN

A-111-4251 REV A

## TABLE OF CONTENTS - Continued.

	Page		Page
7. PREVENTIVE, BASIC CORRECTIVE, AND CORRECTIVE MAINTENANCE OF THE INTERFACE UNIT J-3565/BSC-1 (MESSAGE INTERFACE UNIT).....	F0147-7-1	9. PREVENTIVE AND BASIC CORRECTIVE MAINTENANCE OF THE TSEC/KY-58 (U) F0147-9-1	
1. Preventive, Basic Corrective, and Corrective Maintenance of the Message Interface Unit.....	F0147-7-1-1	1. Preventive and Basic Corrective Maintenance of the TSEC/KY-58 (U)....	F0147-9-1-1
8. THEORY OF THE TSEC/KY-58 (U).	F0147-8-1	REFERENCE MATERIAL	
1. General, Physical, and Functional Description of the TSEC/KY-58 (U)....	F0147-8-1-1	Master Materials List.....	(1)
2. Interface Description of the TSEC/KY-58 (U)....	F0147-8-2-1	Profile Item-to-Topic Objective Assignment Chart.....	(17)
3. Maintenance Description of the TSEC/KY-58 (U)....	F0147-8-3-1	Fault Applicability List.....	(19)
		Answer Sheet.....	(21)

## LESSON PLAN

A-1111-4251 REV A

### SECURITY AWARENESS NOTICE

In the event that classified information is added to this Lesson Plan as a result of instructor personalization, the Lesson Plan shall be marked and handled in accordance with the regulations of the latest edition of the Department of the Navy Supplement to the DoD Information Security Program Regulation OPNAVINST 5510.1 series.

## LESSON PLAN

A-111-4251 REV A

### SAFETY/HAZARD AWARENESS NOTICE

All personnel involved in operation or maintenance of electronic equipment must be thoroughly familiar with the electronic equipment safety precautions contained in Electronic Installation and Maintenance Book (SE000-00-EIM-100), section 3, and NSTM, Electronics, chapter 400, (S9086-ND-STM-000/ch. 400), section 2. In addition, attention is directed to the Navy Occupational Safety and Health Program, OPNAVINST 5100.19 series, Navy Occupational Safety and Health for Forces Ashore, OPNAVINST 5100.23 series, and Safety Policy and Procedures for Conducting Training, CNETINST 1500.20 series.

This equipment employs voltages which are dangerous and may be fatal if contacted by operating or maintenance personnel. Extreme caution must be exercised when working with this equipment. Hazard awareness dictates that this equipment must always be viewed as an integral part of a system and not as a component. While every practical precaution has been incorporated into this equipment, it is not possible or practical to try to list every condition or hazard that you may encounter. Therefore, all operating or maintenance personnel must at all times observe as a minimum, the following:

Don't service or adjust alone. Under no circumstances will a person operate or maintain equipment without the immediate presence or assistance of another person capable of rendering aid. Unless under direct supervision of a qualified person, no person shall operate or maintain equipment for which he is not qualified.

Don't tamper with interlocks. Reliance on interlock circuits to remove power from the equipment is never to be assumed. Until operation of the interlock is verified, equipment is assumed to be in the hazardous mode of operation. Under no circumstances will any access gate, door, or interlock switch be removed, bypassed or modified in any way by other than authorized maintenance personnel and then only after observing proper tag-out procedures.

Training Time Out. Any time a trainee or instructor has apprehension concerning his personal safety, or that of another, he shall verbally signal "TRAINING TIME OUT" to stop the exercise and receive or provide additional instruction as appropriate in accordance with CNETINST 1500.20 series.

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## LESSON PLAN

A-111-4251 REV A

### SAFETY/HAZARD AWARENESS NOTICE - Continued.

Report all hazards. If at any time you detect a hazard, it is your responsibility to report the hazard to ensure that it is corrected. If at any time you detect a "new" or "suspected new" hazard, particularly due to equipment installation, modification or repair, it is your responsibility to ensure that a SAFETYGRAM is submitted to the Naval Safety Center, Norfolk, VA, in accordance with OPNAVINST 5100.19 series. This will ensure that this hazard will be investigated, publicized, or corrected, as required.

The Pre-Mishap plan explains the procedures to follow and essential telephone numbers to call in case of an accident or emergency. It is located by the emergency exit in the laboratory.

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## LESSON PLAN

A-234-5678 REV A

### HOW TO USE THE LESSON PLAN

#### COMPOSITION OF THE LESSON PLAN

This Lesson Plan provides an instructor with the information required to prepare for, and instruct, the topics assigned. As an introduction to each topic, the instructor shall display his/her name and the topic title on the chalkboard. The instructor will also inform the trainees of the Topic Learning Objectives, establish classroom procedures (questioning, note taking, breaks, etc.), and motivate the trainees by emphasizing the importance of the topic. At the end of each day of instruction, the instructor will assign the trainee any materials required in preparation for the following day. Each topic within this Lesson Plan contains the following:

1. Topic Learning Objectives. These objectives are written to reflect the training level(s) of Personnel Performance Profiles (PPPs) that the topic supports. The objectives are derived by applying elements of the Training Objective Statements (TOS) to the elements for the PPPs.
2. Trainee Preparation. This portion assigns the study and review material that the trainee must complete to prepare for this topic. It contains detailed assignments in reference publications, diagrams, and support materials, and is assigned at the end of each day of instruction. The instructor must review the Trainee Preparation portion of the topics planned for the following day and make study assignments accordingly.
3. Instructor Preparation. This part of the topic page contains:
  - a. A reminder to review assigned trainee material.
  - b. A list of all reference materials required by the instructor to prepare for instructing a topic.
  - c. A list of all trainee materials required for the topic, including reference, equipment, support materials, and test equipment.

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## LESSON PLAN

A-234-5678 REV A

### HOW TO USE THE LESSON PLAN - Continued

4. Discussion-Demonstration-Activities. This page is divided into two columns, as follows:

- a. Discussion Point. This column outlines the subject matter to the depth necessary to support the training level(s) of the corresponding topic learning objective. Also, sufficient space is provided for instructor personalization.
- b. Related Instructor Activity. This column lists specific instructor activities, excluding oral discussion, which will aid in trainee learning. This Related Instructor Activity Column provides the instructor specific instructions relative to reference documents, instructional media material, and guidance regarding trainee behavior during presentation of instruction. These activities carry the same number as the discussion points to which they are related. As with the discussion points, space is left for the instructor to add personalizing notes. The phrase "Reference ..." is used to help the instructor locate information applicable to a particular discussion point and to be used to prepare for the material to be covered. It is not intended to direct the instructor to use that reference material in the classroom. The term "Refer to ..." provides direction for the instructor when the reference material is actually intended for use in the classroom. If there is no related instructor activity for a discussion point, the space is left blank and the number omitted.

### FUNCTION OF THE LESSON PLAN

The Lesson Plan expands the approved Curriculum Outline of Instruction into a content format that will serve as an effective plan for instruction. It provides room for instructors to add individual notes. The form of the lesson plan facilitates preparation, minimizes deviation from the approved plan for the topic, and lessens the need for rewriting material already contained in the outline. As the instructors prepare to teach the topic for the first time, they may write in the technical data, information, or notes

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## HOW TO USE THE LESSON PLAN - Continued

to be used to do a professional job of instruction. As instructors gain experience teaching a topic, they may modify and improve the data written in.

All theory discussions must relate to practical work. The design theory of an equipment may be interesting to the instructor, but the trainee must learn how to keep the equipment in proper operating condition. The trainee must bypass all unnecessary knowledge and concentrate on learning to perform the necessary maintenance techniques required by these equipments. Any activity that does not contribute directly to training in the operation and maintenance of these equipments is wasted effort, regardless of how interesting it may seem to be. A thorough understanding of the equipment theory is necessary in order that the practical work on the equipment may be accomplished. The reason for the theory is to assist the trainee in doing practical work.

A Lesson Plan without the instructor's personalization is maintained in the appropriate school offices and has several administrative functions. The Officer-in-Charge and the course supervisors will use it as a guide in determining the kind and depth of the material taught, and as a reference in monitoring the effectiveness of instruction. Each instructor will use it as a reference to determine what the trainees have learned prior to, and will learn subsequent to the topic, so that the instructor can gauge the level and direction of instruction. When approved by the Chief of Naval Technical Training, this Lesson Plan becomes the master plan for instruction.

## USE OF THE LESSON PLAN

When issued to an instructor, this plan becomes his/her personal property, subject only to the regulations that govern classified matter. Each instructor will make handwritten entries in the spaces provided. Personalized topics may be passed on to a relieving instructor. However, they are to be used only for reference purposes in developing a personalized Lesson Plan.

## HOW TO USE THE LESSON PLAN - Continued

Changes to this plan are made by direction of the Chief of Naval Technical Training through recommendations by the school and from the results of the training evaluation program. All changes shall ensure effective trainee comprehension and fulfillment of topic learning objectives.

## STUDY ASSIGNMENTS

Study assignments are provided in the Lesson Plan. One of the objectives of the training is learning to intelligently use the technical manuals associated with the equipments. Training effectiveness depends on conscientious and consistent use of the assignments and schematics in the pertinent technical manuals. All completed assignments should be reviewed with the trainee at the first opportunity.

## EQUIPMENT FAULTS

The Fault Applicability List in the Lesson Plan lists the faults/fault insertion devices required in this course. When desirable, additional faults may be selected from the Fault Applicability List.

## INSTRUCTION SHEETS, EXAMINATIONS, QUIZZES

Instruction Sheets, consisting of Information Sheets, Job Sheets, Assignment Sheets, Problem Sheets, and Diagram Sheets are an integral part of the course and aid trainees in achieving the topic learning objectives. It is necessary to see that these activities are accurately completed.

Answers to questions on the sheets are provided on the Answer Sheet at the back of each Lesson Plan. Students should be instructed to write only on Trainee Name Page, Job Sheets, Diagram Sheets, and Problem Sheets. At the end of the course, the instructor will collect Trainee Guides or Instruction Sheets. New Trainee Name Pages, Job Sheets, Diagram Sheets, and Problem Sheets will be reproduced and inserted so the Trainee Guides and Instruction Sheets may be used in the next course.

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## LESSON PLAN

A-234-5678 REV A

### HOW TO USE THE LESSON PLAN - Continued

Quizzes and examinations are administered to monitor trainee comprehension at the completion of significant areas of instruction.

#### DIVISION OF COURSE MATERIALS INTO FUNCTIONAL PARTS

The course material in the Lesson Plan has been divided into parts to support PPP tables as assigned by the corresponding Table Assignment Charts. It has been further divided into sections to support instruction on theory, operation, preventive maintenance, and corrective maintenance. The sequence of instruction is based on an analysis of the tasks for trainee performance and on the requirements for prerequisite knowledge or skills required for instruction on the more complex equipments.

#### TRAINING MATERIAL SUPPORT PROGRAM

The Training Material Support Program has been established for the purpose of improving the curriculum and other training materials. It is each instructor's responsibility to become familiar with this program as outlined in the applicable management documentation. You are to submit all your suggestions for improvement through a Change Recommendation as outlined in the applicable management documentation. These suggestions should include discrepancies found or any comments that you feel will improve training. There will be no changes in this curriculum until authorized by the Chief of Naval Technical Training.

#### SAFETY PRECAUTIONS

Voltages present in the equipment are extremely dangerous. The delicacy of some equipment and the stringent ventilation requirements for solid-state electronic circuits must be continuously stressed. Safety must be part of each day of training so that the trainee will develop safe working habits. Practice and Teach Safety!

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# LESSON PLAN

A-111-4251 REV A

## COURSE MASTER SCHEDULE

A-111-4251

Length of Period: 50 minutes

### WEEK 1

#### DAY 1

Topic No.	Type	Period	Topic	Ratio
F0147.1.1	Class	1	General and Documentation description of the Power Distribution Group	25:1
F0147.1.2	Class	2	General, Physical, Functional and Interface description of AN/BRR-6	25:1
F0147.1.2	Class	3	Same	25:1
F0147.1.2	Class	4	Same	25:1

Only Part F0147, sections 1 and 2 are used as Examples in Volume II. The others are intentionally omitted.

### WEEK 3

#### DAY 1

Topic No.	Type	Period	Topic	Ratio
F0147.1.	Test	81	Power Distribution Group	25:1
F0147.2.1	Class	82	Basic Operation of the DSS	25:1
F0147.2.1	Lab	11	Same	10:1

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A-5-23

## LESSON PLAN

A-111-4251 REV A

### COURSE LEARNING OBJECTIVES

Upon successful completion of this course, the trainees will have acquired the following knowledge and skills and be able to:

#### Knowledge:

1. Describe the theory necessary to support and understand the performance of normal and degraded operational tasks and all preventive maintenance without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the following:
  - a. TRIDENT Exterior Communications System (ECS)
  - b. Data Switching Subsystem (DSS)
  - c. Power Distribution Group
  - d. Towed Buoy Antenna AN/BRR-6
2. Describe the theory necessary to support and understand the performance of documented fault isolation and repair without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the following:

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#### Skills:

1. Perform normal and degraded operational procedures with supervision on the following:
  - a. TRIDENT Exterior Communications System (ECS)
  - b. Data Switching Subsystem (DSS)
  - c. Power Distribution Group
  - d. Towed Buoy Antenna AN/BRR-6
2. Perform preventive maintenance procedures with supervision on the following:
  - a. TRIDENT Exterior Communications System (ECS)
  - b. Data Switching Subsystem (DSS)
  - c. Power Distribution Group
  - d. Towed Buoy Antenna AN/BRR-6

## LESSON PLAN

A-111-4251 REV A

### COURSE LEARNING OBJECTIVES - Continued.

#### Knowledge:

- a. PP-7474/BSC-1, PP-7475/BSC-1 Power Supplies
- b. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
3. Describe the theory necessary to support undocumented fault isolation and repair requiring advanced analysis without going into signal or electrical flow, computer instructions, or detailed mechanical component breakdown except for those mechanical or logic elements or circuits unique to the equipment or program of the Interface Unit J-3565/BSC-1 (Message Interface Unit).

#### Skills:

3. Perform, with supervision, documented fault isolation and repair procedures to the authorized maintenance level on the following:
  - a. PP-7474/BSC-1, PP-7475/BSC-1 Power Supplies
  - b. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
4. Perform fault isolation and repair of faults that cannot be located using procedures contained in prescribed documentation or that require advanced analysis, with supervision, on the Interface Unit J-3565/BSC-1 (Message Interface Unit).

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Part F0147

Part F0147

EXTERIOR COMMUNICATIONS SYSTEM (ECS) ECLECTIC SYSTEM

This part contains information from PPP Tables F0147, F0194, F0156, and F0202.

Section 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP (T1, T2)

Section 2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) (01, 02)

Section 3. PREVENTIVE MAINTENANCE OF THE TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS) (P1)

Section 4. THEORY OF THE DATA SWITCHING SUBSYSTEM (DSS) (T1, T2)

Section 5. BASIC CORRECTIVE MAINTENANCE OF THE SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 SWITCHING UNITS AND PP-7474/BSC-1, PP-7475/BSC-1 POWER SUPPLIES (C1)

Section 6. THEORY OF AND ADVANCED THEORY OF THE INTERFACE UNIT J-3565/BSC-1 (MESSAGE INTERFACE UNIT) (KINGS BAY) (T2, T3)

Section 7. PREVENTIVE, BASIC CORRECTIVE, AND CORRECTIVE MAINTENANCE OF THE INTERFACE UNIT J-3565/BSC-1 (MESSAGE INTERFACE UNIT) (P1, C1, C2)

Section 8. THEORY OF THE TSEC/KY-58 (T1)

Section 9. PREVENTIVE AND BASIC CORRECTIVE MAINTENANCE OF THE TSEC/KY-58 (P1, C1)

A-111-4251

TAB PAGE

## LESSON PLAN

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### Section 1: INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP

<u>Topic No.</u>	<u>Topic Title</u>	<u>Page</u>
1	General and Documentation Description of the Power Distribution Group	F0147-1-1-1
2	General, Physical, Functional, and Interface Description of the AN/BRR-6	F0147-1-2-1
3	Operational Description of the DSS	F0147-1-3-1
4	Maintenance Description of the ECS	F0147-1-4-1

The titles are inconsistent between the section title and topics because a variety of topics were selected to present a broader sampling.

F0147-1-1

## LESSON PLAN

### 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP

A-1111-4251 REV A  
LAB PERIODS: 0.0  
CLASS PERIODS: 1.0

#### Topic 1: GENERAL AND DOCUMENTATION DESCRIPTION OF THE POWER DISTRIBUTION GROUP

##### Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. State the functions of the Power Distribution Group.
2. State that the Power Distribution Group consists of the following major functional areas. Include the function of each to support normal operations.
  - a. Power panel
  - b. Power distribution black panel
  - c. Power distribution red panel
  - d. Component compartment
  - e. Ground fault indicator panel

Topic Learning Objectives (TLOs) should be in instructional sequence. This is usually the same as the PPP table line item sequence.

3. Define the abbreviations, terms, and symbols used with the Power Distribution Group to support all operations and preventive maintenance.

"All operations" is used as the condition modifier to indicate that the TLO is intended to support normal operations, casualty/degraded/abnormal/not full mission capable modes of operation, and/or operation requiring advanced analysis as applicable to the subsystem or equipment identified therein.

TLOs should be tailored to suit the subject matter of the topic (e.g., if there are no symbols used with the Power Distribution Group for operation and preventive maintenance, then symbols should not appear in the TLO or the related DP in the DDA pages).

4. State the operational characteristics and capabilities of the Power Distribution Group to support all operations and preventive maintenance.
5. State the security requirements for the Power Distribution Group to support all operations and preventive maintenance.

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 1: GENERAL AND DOCUMENTATION DESCRIPTION OF THE POWER DISTRIBUTION GROUP - Continued. A-111-4251 REV A

6. Describe the organization, content, and use of all technical documentation provided for use with the Power Distribution Group to support normal operations.

Whenever an instruction is used it is assumed the latest version will be used.

Trainee Preparation

A. Trainee Support Material:

1. None

Whenever material should be reviewed by the trainee before the topic, it should be listed.

B. Reference Publications:

1. None

Instructor Preparation

A. Review Assigned Trainee Material.

B. Reference Publications:

1. EE109-AJ-MMO-010/W153-PDG  
2. NAVSEA S9SSB-X9-SSM-12C/(U)726V2P7C1-8  
3. OPNAVINST 5510.1 series

C. Training Materials Required:

1. Trainee Guide

2. Publications:

- a. EE109-AJ-MMO-010/W153-PDG

3. Wall Charts:

- a. A-101-0168-F0147-23

4. Equipment:

- a. "CLASSIFIED SESSION" sign

All listings on the topic pages, except prefaulted modules, should be listed in alphanumeric order.

## LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 1. GENERAL AND DOCUMENTATION DESCRIPTION OF THE POWER DISTRIBUTION GROUP

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### DISCUSSION POINT

#### 1. Introduction

Notes, as you see in the RIA column, are tailored to the type of material being handled, and should appear at the beginning of any topic that calls for the use of any classified information.

### RELATED INSTRUCTOR ACTIVITY

#### NOTE

Inform the trainees that portions of the information covered under this topic are classified. Provide classification guidance sufficient to enable identification of classified information. Reference OPNAVINST 5510.1 series. Review and emphasize the regulations governing note taking and the handling and storage of classified material in a classroom environment. Refer trainees to Outline Sheet 4-1-1 for topic objectives.

Refer to Information Sheet F0147-1-3-1

#### NOTE

Post a "Classified Session" sign outside the classroom and direct the trainees not to transcribe classified material.

#### 2. Security requirements

2. Reference OPNAVINST 5510.1

F0147-1-1-3

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 1. GENERAL AND DOCUMENTATION DESCRIPTION OF THE POWER DISTRIBUTION GROUP

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

a. Equipment

Refer to Diagram Sheet F0147-1-4-1

b. Material

3. Functions of the Power Distribution Group

3. Reference EE109-AJ-MMO-010, paragraph 3-2.

4. Major functional areas and their functions

4. Display Wall Chart A-101-0168-F0147-23.  
Reference paragraphs 1-3 and 1-3.a.

a. Power panel

## LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 1. GENERAL AND DOCUMENTATION DESCRIPTION OF THE POWER DISTRIBUTION GROUP

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### DISCUSSION POINT

- b. Power distribution black panel
- c. Power distribution red panel
- d. Component compartment
- e. Ground fault indicator panel

### RELATED INSTRUCTOR ACTIVITY

The standard rules for capitalization (proper names, titles, etc.) apply to discussion points. For the ECS components, subsystem names and equipment nomenclature are capitalized, but common names are not (e.g., Buoy Depth Control Unit C-10258/BRR-6 is capitalized, because it is the nomenclature; whereas buoy depth control unit is not, because it is the common name).

### 5. Technical documentation

- a. Communications Central AN/BSC-1 operation and maintenance instructions

5. Refer to Information Sheet F0147-1-1-1.

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 1. GENERAL AND DOCUMENTATION DESCRIPTION OF THE POWER DISTRIBUTION GROUP A-111-4251 REV A

DISCUSSION POINT	RELATED INSTRUCTOR ACTIVITY
(1) Organization	
(2) Content	
(3) Use	
b. TRIDENT Submarine Integrated Radio Room Cable List	
(1) Organization	
(2) Content	



LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 1. GENERAL AND DOCUMENTATION DESCRIPTION OF THE POWER DISTRIBUTION GROUP

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(3) Use

Refer to Job Sheet F0147-5-1-1

6. Abbreviations, terms, and symbols

6. Refer to glossary

7. Operational characteristics and capabilities

7. Reference paragraphs 1-3.a and 2-3.e and SSM V2P7, chapter 1, paragraph 3.3.3.a.

There should be a numbered (first level) discussion point for each TLO, except where teachability dictates otherwise (e.g., when grouping all DPs for a specific unit together in a topic that covers several units), and the discussion points should be key words that relate directly to the TLO. Additionally, the wording of discussion points that relate to the various PPP table line items should be the same throughout the curriculum materials (e.g., wherever characteristics and capabilities is a discussion point, it should always be worded "Operational characteristics and capabilities"; wherever safety is a discussion point, it should always be worded "Safety precautions"; etc.).

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 1. GENERAL AND DOCUMENTATION DESCRIPTION OF THE POWER DISTRIBUTION GROUP

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DISCUSSION POINT

8. Review and summary

RELATED INSTRUCTOR ACTIVITY

9. Assignment

9. Make study assignment, Assignment Sheet  
F0147-1-2-1

# LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
 Topic 2: GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6  
 A-111-4251 REV A  
 LAB PERIODS:             
 CLASS PERIODS: 3

## Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. State the functions of the AN/BRR-6.
2. State the major functions of AN/BRR-6 consisting of: Include the function of each to support normal operations.
  - a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)
  - b. Receiver Group OR-197/BRR-6
  - c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6
  - d. Buoy Cradle MT-4905/BRR-6
  - e. Reeling Machine RL-275/BRR-6
  - f. Sensor Group OA-8906/BRR-6
  - g. Buoy Door Sensing Switch
  - h. Buoy Control Indicator C-10256A/BRR-6

- i. Antenna Control Indicator C-10257/BRR-6
- j. Buoy Depth Control Indicator C-10258A/BRR-6
- k. Relay Assembly RE-1115/BRR-6
- l. Interconnecting Box J-3461/BRR-6
- m. Towed Array Control Indicator Panel

Subitems should appear exactly as they do on the PPP table.

3. Define the abbreviations and terms used with the AN/BRR-6 to support all operations and preventive maintenance.
4. State the operational characteristics and capabilities of the AN/BRR-6 to support all operations and preventive maintenance.
5. State the security requirements for the AN/BRR-6 to support all operations and preventive maintenance.

## LESSON PLAN

### 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP Topic 2: GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6 - Continued.

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6. Describe all major and associated components of the AN/BRR-6 to support all operations and preventive maintenance. Include names, nomenclature, physical appearance, reference designers, locations, and construction features.
  - a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)
  - b. Receiver Group OR-197/BRR-6
  - c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6
  - d. Buoy Cradle MT-4905/BRR-6
  - e. Reeling Machine RL-275/BRR-6
  - f. Sensor Group OA-8906/BRR-6
  - g. Buoy Door Sensing Switch
  - h. Buoy Control Indicator C-10256A/BRR-6
  - i. Antenna Control Indicator C-10257/BRR-6
  - j. Buoy Depth Control Indicator C-10258A/BRR-6

- k. Relay Assembly RE-1115/BRR-6
- l. Interconnecting Box J-3461/BRR-6
- m. Towed Array Control Indicator Panel

The TB-18A/BRR-6 and EE126-FA-MMF-010/E110-BRR-6 are fictitious and used for illustration purposes only.

7. Describe the controls and indicators directly associated with the AN/BRR-6 to support all operations and preventive maintenance. Include names, reference designers, positions, conditions, colors, locations, and functions.

TLOs should contain only those "include" statements that are applicable to the subject matter and TOS level being covered (e.g., construction features may not be applicable to every physical description topic).

8. Describe how the AN/BRR-6 works (functional operation) to support all operations and preventive maintenance. Include signal flow, sequential operation, and indications.

# LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
 Topic 2: GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6 - Continued. A-111-4251 REV A

- |    |  |    |  |
|----|--|----|--|
| a. | Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay) | 9. | Describe the functional interface between the AN/BRR-6 and related external equipments to support all operations and preventive maintenance. |
| b. | Receiver Group OR-197/BRR-6  |    |  |
| c. | Special Purpose Electrical Cable Assembly CX-13053/BRR-6               | a. | Power sources  |
| d. | Buoy Cradle MT-4905/BRR-6  | b. | Input signals  |
| e. | Reeling Machine RL-275/BRR-6   | c. | Output signals   |
| f. | Sensor Group OA-8906/BRR-6   |    |  |
| g. | Buoy Door Sensing Switch   |    | Trainee Preparation  |
| h. | Buoy Control Indicator C-10256A/BRR-6                                  | A. | Trainee Support Material:  |
| i. | Antenna Control Indicator C-10257/BRR-6                                | 1. | Complete Assignment Sheet F0147-1-2-1.   |
| j. | Buoy Depth Control Indicator C-10258A/BRR-6                            | B. | Reference Publications:  |
| k. | Relay Assembly RE-1115/BRR-6   | 1. | EE125-FA-MMF-010/E110-BRR-6  |
| l. | Interconnecting Box J-3461/BRR-6                                       | 2. | EE126-FA-MMF-010/E110-BRR-6 (Kings Bay)  |
| m. | Towed Array Control Indicator Panel                                    | 3. | NAVSEA S9SSB-X9-SSM-640/(U)726V4P5C2 (SSM V4P5C2)  |

F0147-1-2-3

## LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2: GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6 - Continued. A-111-4251 REV A

### Instructor Preparation

A. Review Assigned Trainee Material.

B. Reference Publications:

1. EE125-FA-MMF-010/E110-BRR-6
2. EE126-FA-MMF-010/E110-BRR-6 (Kings Bay)
3. NAVSEA S9SSB-X9-SSM-640/(U)726V4P5C2 (SSM V4P5C2)
4. OPNAVINST 5510.1 series

C. Training Materials Required:

1. Trainee Guide
2. Publications:

a. EE125-FA-MMF-010/E110-BRR-6

b. NAVSEA S9SSB-X9-SSM-640/(U)726V4P5C2 (SSM V4P5C2)

3. Wall Charts:

Publications required for use with assignment sheets are not necessarily listed under Training Materials Required. Only those publications required for use in the classroom for the conduct of the topic are listed under Training Materials Required.

a. A-101-0168-F0147-1

b. A-101-0168-F0147-10

F0147-1-2-4

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6 A-111-4251 REV A

DISCUSSION POINT

Introduction

1. Security requirements

a. Equipment

b. Material

2. Functions of the AN/BRR-6

3. Abbreviations and terms

RELATED INSTRUCTOR ACTIVITY

Note: Provide trainees with lesson topic title and objectives.

1. Reference OPNAVINST 5510.1 series.

2. Reference EE125-FA-MMF-010, paragraph 3-1.

3. Refer to Information Sheet F0147-1-2-2.

F0147-1-2-5

# LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
 Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6 A-111-4251 REV A

## DISCUSSION POINT

## RELATED INSTRUCTOR ACTIVITY

4. Major functional areas/major and associated components 4. Refer to EE125-FA-MMF-010, figure 1-3 and tables 1-1 and 1-2. Reference paragraph 1-2.1.1.

a. Towed Buoy TB-17/BRR-6 (Unit 1) (Bangor)

a. Reference paragraphs 1-2.2 and 3-2.

or

or

Towed buoy TB-18/BRR-6 (Unit 1) (Kings Bay)

Reference EE125-FA-MMF-010, paragraphs 1-2.2 and 3-4 through 3-8.

(1) Name/nomenclature

Discussion point 4a shows an example of how site unique requirements may be addressed.

F0147-1-2-6



LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(2) Location/reference designator

(3) Physical appearance/construction  
features

(4) Function

The sub-DPs for the major DPs associated with the same PPP table line item should be consistent throughout the curricula materials (e.g., all sub-DPs for major and associated components wherever appearing should be the same as these). The only variation would be where one or more do not apply. In those cases, the same structure should still be retained using those that do apply.

b. Receiver Group OR-197/BRR-6 (Unit 2)

b. Reference EE125-FA-MMF-010, paragraph  
1-2.3, 3-4.1, and 3-4.2.3.

# LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
 Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A-111-4251 REV A

DISCUSSION POINT RELATED INSTRUCTOR ACTIVITY

(1) Name/nomenclature

(2) Location/reference designator

(3) Physical appearance/construction features

(4) Function

c. Special Purpose Electrical Cable Assembly  
 CX-13053/BRR-6 (Unit 3) c. Reference paragraph 1-2.4.

F0147-1-2-8

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

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DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(1) Name/nomenclature

(2) Location/reference designator

(3) Physical appearance/construction  
features

(4) Function

d. Buoy Cradle MT-4905/BRR-6 (Unit 4)

d. Reference paragraph 1-2.5.

(1) Name/nomenclature

F0147-1-2-9

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(2) Location/reference designator

(3) Physical appearance/construction features

(4) Function

e. Reeling Machine RL-275/BRR-6 (Unit 5)

e. Reference paragraphs 1-2.6, 3-3, 3-4.1, and 3-4.2.1.

(1) Drum assembly

F0147-1-2-10

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(a) Name/nomenclature

(b) Location/reference designator

(c) Physical appearance/construction  
features

(d) Function

(2) Aft tension sheave assembly

(a) Name/nomenclature

F0147-1-2-11

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(b) Location/reference designator

(c) Physical appearance/construction  
features

(d) Function

(3) Drive Unit

(a) Name/nomenclature

(b) Location/reference designator

F0147-1-2-12

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(c) Physical appearance/construction  
features

(d) Function

f. Sensor Group OA-8906/BRR-6 (Unit 6)

f. Reference paragraphs 1-2.7 and 3-4.3.3.

(1) Name/nomenclature

(2) Location/reference designator

(3) Physical appearance

Note that not all sub-DPs apply to the sensor group  
("construction features" is missing from item f(3)), but the  
same structure is retained.

F0147-1-2-13

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A-111-4251 REV A

DISCUSSION POINT

(4) Function

g. Buoy Door Sensing Switch

g. Reference figure 3-2 and paragraph 3-4.3.1.

RELATED INSTRUCTOR ACTIVITY

(1) Name/nomenclature

(2) Location/reference designator

(3) Physical appearance/construction features

(4) Function

F0147-1-2-14



LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

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DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- h. Buoy Control Indicator C-10256A/BRR-6      h. Reference paragraph 1-2.8.  
(Unit 8)

(1) Name/nomenclature

(2) Location/reference designator

(3) Physical appearance/construction  
features

(4) Function

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A-111-4251 REV A

DISCUSSION POINT

(5) Controls and indicators

RELATED INSTRUCTOR ACTIVITY

(5) Refer to figure 2-1 and table 2-1.

(a) Names

(b) Locations/reference designators

(c) Positions/conditions/colors

(d) Functions

Note that this is a case where, rather than have a first level DP for the "controls and indicators" TLO, the controls and indicators are covered with the physical description of the unit.

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

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DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- i. Antenna Control Indicator C-10257/BRR-6
- i. Display Wall Chart A-101-0168-F0147-1.  
Reference paragraphs 1-2.9, 3-1.4,  
3-4.1, and 3-4.2.3.

5. Functional operation

- 5. Refer to EE125-FA-MMF-010, figure 1-3.  
Reference paragraphs 3-1.1 through 3-4.3.3.

a. Signal flow

b. Sequential operation

c. Indications

F0147-1-2-17

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6 A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

6. Functional interface

5. Refer to figure 5-1, sheet 2 of 3.

a. Power sources

b. Input signals

c. Output signals

7. Operational characteristics and capabilities

7. Refer to table 1-1. Reference paragraphs 1-2.1 and 3-1.1.

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 2. GENERAL, PHYSICAL, FUNCTIONAL, AND INTERFACE DESCRIPTION OF THE AN/BRR-6

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

8. Review and summary

9. Assignment

9. Make study assignments if required.

# LESSON PLAN

## 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP Topic 3: OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A  
LAB PERIODS:  
CLASS PERIODS: 1.50

### Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. Describe the authority and regulations pertaining to normal operation of the following equipment, including external equipments which interface with them.

- a. TSEC/KG-84C
- b. TSEC/KG-36
- c. TSEC/KWR-46
- d. TSEC/KY-75
- e. TSEC/KY-58

2. Describe the authority and regulations pertaining to all operations of the DSS and the following equipment, including external equipments which interface with them.

- a. SA-2199/BSC-1, SA-2200/BSC-1,  
SA-2201/BSC-1 Switching Units
- b. Signal Data Converter CV-3510B/UG

3. Describe the routine pre-operational, operational, and post-operational tasks for normal operation of the DSS and the following equipment.

- a. SA-2199/BSC-1, SA-2200/BSC-1,  
SA-2201/BSC-1 Switching Units
- b. Signal Data Converter CV-3510B/UG
- c. TSEC/KG-84C
- d. TSEC/KG-36
- e. TSEC/KWR-46
- f. TSEC/KY-75
- g. TSEC/KY-58

4. Describe indications which may occur during normal operation of the DSS and the following equipment. Include alarms, indicators, and displays.

- a. TSEC/KG-84C
- b. TSEC/KG-36
- c. TSEC/KWR-46

F0147-1-3-1

# LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
 Topic 3: OPERATIONAL DESCRIPTION OF THE DSS - Continued. A-111-4251 REV A

- |   |   |
|---|---|
| d. TSEC/KY-75   | b. TSEC/KG-36   |
| e. TSEC/KY-58   | c. TSEC/KWR-46  |
| 5. Describe indications which may occur during all operations of the DSS and the following equipment. Include alarms, indicators, and displays. | d. TSEC/KY-75   |
| a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units  | e. TSEC/KY-58   |
| b. Signal Data Converter CV-3510B/UG  | 8. Describe personnel and equipment safety precautions which are to be observed during all operations of the DSS and the following equipment. |
| 6. Describe casualty/degraded/abnormal modes of operation for the DSS and the following equipment.  | a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units  |
| a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units  | b. Signal Data Converter CV-3510B/UG  |
| b. Signal Data Converter CV-3510B/UG  | Trainee Preparation   |
| 7. Describe personnel and equipment safety precautions which are to be observed during normal operation of the DSS and the following equipment. | A. Trainee Support Material:  |
| a. TSEC/KG-84C  | 1. None   |
|   | B. Reference Publications:  |
|   | 1. None   |

F0147-1-3-2

# LESSON PLAN

## 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP Topic 3: OPERATIONAL DESCRIPTION OF THE DSS - Continued.

A-111-4251 REV A

### Instructor Preparation

#### A. Review Assigned Trainee Material.

#### B. Reference Publications:

1. CNETINST 1500.20 series
2. COMSUBPAC/COMSUBLANTINST 5400.38 series
3. EE109-AC-MMO-010/W153-BSC1-CMT
4. EE109-AL-MMO-010/W153-DSS
5. KAO-83E/TSEC
6. KAO-137E/TSEC
7. KAO-154B/TSEC
8. KAO-168B/TSEC
9. KAO-207A/TSEC

#### C. Training Materials Required:

##### 1. Trainee Guide

##### 2. Publications:

- a. EE109-AL-MMO-010/W153-DSS
- b. NAVSEA S9SSB-X9-SSM-84E/  
(U)726V6P3B7E-1 (SSM V6P3B7E-1)
- c. NAVSEA S9SSB-X9-SSM-84E/  
(U)726V6P3B7E-2 (SSM V6P3B7E-2)
- d. NAVSEA S9SSB-X9-SSM-84E/  
(U)726V6P3B7E-3 (SSM V6P3B7E-3)

##### 3. Transparencies:

- a. F0147-1-3-1

F0147-1-3-3



LESSON PLAN

A-111-4251 REV A

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3: OPERATIONAL DESCRIPTION OF THE DSS - Continued.

- b. F0147-1-3-2
- c. F0147-1-3-3
- d. F0147-1-3-4
- e. F0147-1-3-5
- f. F0147-1-3-6

4. Equipment:

- a. KOI-18/TSEC Tape Reader and Fill  
Cable
- b. KYK-13/TSEC Electronic Transfer  
Device

F0147-1-3-4

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

Introduction

1. Authority and regulations  
(including external equipments)

- a. SA-2199/BSC-1, SA-2200/BSC-1,  
SA-2201/BSC-1 Switching Units

- b. CV-3510B/UG

- c. TSEC/KG-84C

- d. TSEC/KG-36

RELATED INSTRUCTOR ACTIVITY

Note: Provide lesson topic title and refer trainees to the objectives.

1. Reference COMSUBPAC/COMSUBLANTINST 5400.38 series (SSBN 726 class SSORM), chapter 2.

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

e. TSEC/KWR-46

f. TSEC/KY-75

g. TSEC/KY-58

2. Normal operational tasks and indications

a. Routine pre-operational and  
operational procedures

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(1) Interconnecting Group ON-165/BSC-1

(1) Refer to SSM V6P3B7E-1, FP 701-7.

(a) Alarms/indicators

(b) Displays

(2) Interconnecting Group ON-166/BSC-1

(2) Refer to FP 701-8.

(a) Alarms/indicators

(b) Displays

FO147-1-3-7

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(3) Decoder Group OX-48/BSC-1

(3) Refer to FP 701-11.

(a) Alarms/indicators

(b) Displays

(4) Interconnecting Group HNF-3-2/TSEC

(4) Refer to FP 701-2.

(a) Alarms/indicators

(b) Displays

F0147-1-3-8

# LESSON PLAN

## 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

### DISCUSSION POINT

- b. Crypto equipment initialization

### RELATED INSTRUCTOR ACTIVITY

- b. Demonstrate key setting using KOI-18/TSEC. Tape Reader and Fill Cable and KYK-13/TSEC Electronic Transfer Device. Reference KAO-207A/TSEC, paragraph 3-10.d.

(1) TSEC/KW-7

- (1) Reference KAO-83E/TSEC, section 2007.

(2) TSEC/KG-36

- (2) Reference KAO-137E/TSEC, paragraphs 4100 through 4104.

(3) TSEC/KWR-46

- (3) Reference KAO-207A/TSEC, paragraph 3-10.d.

(4) TSEC/KY-58

- (4) Reference KAO-168B/TSEC, paragraph 3002.

F0147-1-3-9

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

(5) TSEC/KY-75

RELATED INSTRUCTOR ACTIVITY

(5) Reference KAO-154B/TSEC, section 3002.

c. Display console menus

NOTE

Discuss only the DSS component of the following transparencies.

(1) Radio room status

(1) Display Transparency F0147-1-3-1.

(2) Power status

(2) Display Transparency F0147-1-3-2.

F0147-1-3-10

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(3) Equipment status

(3) Display Transparency F0147-1-3-3.

(4) Red data switch status

(4) Display Transparency F0147-1-3-4.

(5) Black data switch status

(5) Display Transparency F0147-1-3-5.

(6) Local/remote status

(6) Display Transparency F0147-1-3-6.

d. Post-operational procedures

(1) Interconnecting Group ON-165/BSC-1

(1) Refer to SSM V6P3B7E-1, FP 701-7.

F0147-1-3-11



LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(a) Indicators

(b) Displays

(2) Interconnecting Group ON-166/BSC-1

(2) Refer to FP 701-8.

(a) Indicators

(b) Displays

(3) Decoder Group OX-48/BSC-1

(3) Refer to FP 701-11.

F0147-1-3-12

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(a) Indicators

(b) Displays

(4) Interconnecting Group HNF-3-2/TSEC

(4) Refer to FP 701-2.

(a) Indicators

(b) Displays

F0147-1-3-13

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

3. Casualty/degraded/abnormal modes of operation and indications

3. Reference EE109-AL-MMO-010, paragraph 2-3.b.

a. Local mode of operation

a. Refer to SSM V6P3B7E-2, AP 704-5 and EE109-AL-MMO-010, table 2-15. Reference paragraph 2-3.b.

(1) Alarms/indicators

(2) Displays

b. Emergency operation

b. Refer to tables 2-17 through 2-20; SSM V6P3B7E-2, AP 704-5; and SSM V6P3B7E-3, ERP 701-9. Reference EE109-AL-MMO-010, paragraph 2-3.e.

F0147-1-3-14

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(1) Alarms/indicators

(2) Displays

c. Return to initial conditions

(1) Alarms/indicators

(2) Displays

F0147-1-3-15

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

d. Emergency turn off

d. Refer to table 2-21. Reference paragraph 2-3.f.

(1) Alarms/indicators

(2) Displays

4. Safety precautions

4. Refer to the Hazard Awareness Notice in the Trainee Guide.

a. Personnel

F0147-1-3-16

# LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
 Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

## DISCUSSION POINT

## RELATED INSTRUCTOR ACTIVITY

(1) Training Time Out (TTO) policy

(1) Refer to Information Sheet  
 F0147-1-3-1.

Reference CNETINST 1500.20 series.

TTO procedures are to be covered under the first safety discussion point in the course. Thereafter, the procedures are reviewed prior to the beginning of each lab period per CNET 1500.20.

b. Equipment

(1) SA-2199/BSC-1, SA-2200/BSC-1,  
 SA-2201/BSC-1 Switching Units

b. Reference EE109-AC-MMO-010,  
 paragraph 1-1; SSM V6P3B7E-1,  
 PG 701; and EE109-AL-MMO-010,  
 paragraph 1-1.

(2) CV-3510B/UG

F0147-1-3-17

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(3) TSEC/KG-84C

(4) TSEC/KG-36

(5) TSEC/KWR-46

(6) TSEC/KY-75

(7) TSEC/KY-58

F0147-1-3-18

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 3. OPERATIONAL DESCRIPTION OF THE DSS

A-111-4251 REV A

DISCUSSION POINT

5. Review and summary

RELATED INSTRUCTOR ACTIVITY

6. Assignment

6. Make study assignments if required.



# LESSON PLAN

## 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP Topic 4: MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A  
LAB PERIODS: 1.75  
CLASS PERIODS: 1.75

### Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. Define the maintenance policy for the ECS and the following subsystems and equipment required to support preventive maintenance as the requirement for periodic performance of tasks to minimize equipment malfunctions. Including: Servicing - scheduled or unscheduled inspections, cleaning, lubrication, corrosion control and any other function in support of maintaining and equipment full mission capable; and Operational checks (Confidence or Performance checks, and Degradation/deterioration checks).

#### a. Control, Monitor, and Test (CMT) Subsystem

- (1) Interface Unit J-3565/BSC-1 (Message Interface Unit)
- (2) Interface Unit J-3566/BSC-1 (Digital Interface Unit Interface)
- (3) Interface Unit J-3568/BSC-1 (HSP/Magnetic Tape Unit Interface Unit)

#### (4) Recorder-Reproducer Control C-10447/BSC-1

#### (5) Recorder-Reproducer Unit RD-442/BSC-1

#### (6) Comparator CM-507/BSC-1

#### b. Data Switching Subsystem (DSS)

- (1) SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units

#### (2) Signal Data Converter CV-3510B/UG

#### c. Very Low Frequency/Low Frequency (VLF/LF) Subsystem

#### (1) Radio Receiver R-2109/BSC-1

#### (2) Radio Receiver R-2320/URR

#### (3) Digital Data Processor CP-1071B/WR

#### (4) Digital Data Demodulator MD-1191/WRR-7B

#### (5) Electrical Equipment Enclosure CY-8410/WRR-7B

F0147-1-4-1

# LESSON PLAN

## 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP Topic 4: MAINTENANCE DESCRIPTION OF THE ECS - Continued.

A-111-4251 REV A

- (6) Power Supply PP-8098/BSC-1
  - d. High Frequency/Ultra High Frequency (HF/UHF) Subsystem
    - (1) Radio Receiver-Transmitter RT-1107(V)12/WSC-3(V)
    - (2) Voice Switch Unit Control C-10975
    - (3) Command Center Telephone Terminal
  - e. Support Subsystem
    - (1) Teleprinter TT-624/UG
    - (2) Power Distribution Group
    - (3) Audio Tape Recorder CMS 1022
    - (4) AN/BSC-1 Electronic Equipment Air Coolers
  - f. Antenna Suite
    - (1) Multifunction Mast Antenna Group OE-207/BR
    - (2) Towed Buoy Antenna AN/BRR-6
2. Describe preventive maintenance procedures for the ECS and the subsystems and equipment listed in learning objective 1. Include recognition and interpretation of indications, records, reports, and instructions.
  3. Describe personnel and equipment safety precautions, including tag-out procedures, which are to be observed while performing preventive maintenance on the ECS and the subsystems and equipment listed in learning objective 1.

Where ten or more sub-items exist for a series of TLOs, it is permissible to have the listing appear in the first TLO only. Then, refer back to that learning objective in the remaining TLOs.

- Trainee Preparation
- A. Trainee Support Material:
1. None

F0147-1-4-2

# LESSON PLAN

A-111-4251 REV A

## 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP Topic 4: MAINTENANCE DESCRIPTION OF THE ECS - Continued.

### B. Reference Publications:

1. None

8. MIP C-669 MRCs
9. MIP C-670 MRCs
10. MIP C-672 MRCs
11. MIP C-673 MRCs
12. MIP C-674 MRCs
13. MIP C-675 MRCs
14. MIP C-676 MRCs
15. MIP C-677 MRCs
16. MIP C-796 MRCs
17. NAVEDTRA 172-17-00-84
18. OPNAVINST 3120.32 series
19. OPNAVINST 4790.4 series
20. OPNAVINST 5100 series
21. TTFBANGORINST 5100.5 series (Bangor)
22. TTFKINGSBAYINST 5100.5 series (Kings Bay)

### Instructor Preparation

#### A. Review Assigned Trainee Material.

#### B. Reference Publications:

1. CNTECHTRAINST 5100.5 series
2. COMSUBLANTINST 5101.2 series (Kings Bay)
3. COMSUBPACINST 5101.4 series (Bangor)
4. MIP C-447 MRCs
5. MIP C-458 MRCs
6. MIP C-531 MRCs
7. MIP C-668 MRCs

# LESSON PLAN

## 1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP Topic 4: MAINTENANCE DESCRIPTION OF THE ECS - Continued.

A-111-4251 REV A

### C. Training Materials Required:

#### 1. Trainee Guide

#### 2. Publications:

- a. MIP C-447 MRCs
- b. MIP C-458 MRCs
- c. MIP C-531 MRCs
- d. MIP C-668 MRCs
- e. MIP C-669 MRCs
- f. MIP C-670 MRCs
- g. MIP C-672 MRCs
- h. MIP C-673 MRCs
- i. MIP C-674 MRCs
- j. MIP C-675 MRCs

#### k. MIP C-676 MRCs

#### l. MIP C-677 MRCs

#### m. MIP C-796 MRCs

#### 3. Equipment:

- a. NAVSEA Form 9210/9 (Danger/Caution Tag-Out Record Sheet)
- b. NAVSHIPS Form 9890/5 (Caution Tag)
- c. NAVSHIPS Form 9890/6 (Out of Calibration Sticker)
- d. NAVSHIPS Form 9890/8 (Danger Tag)
- e. NAVSHIPS Form 9890/7 (Out of Commission Sticker)
- f. SUBGEN Form 9890/31 (Index/Audit Record)

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

1. Introduction
2. Preventive maintenance policy

RELATED INSTRUCTOR ACTIVITY

Note: Provide trainees with lesson topic title and the objectives.

NOTE: Ensure that discussion points 1 through 1.b(3) are covered for each subsystem and equipment listed in learning objective 1 on the topic page.

a. Servicing

- a. Reference OPNAVINST 4790.4 series, paragraphs 2-3.9 and 5-1 through 5-1.2.

(1) Cleaning

(2) Inspection

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(3) Lubrication

b. Operational checks (confidence or self-tests)

(1) Pre-maintenance procedures

(2) Performance checks

(3) Degradation/deterioration checks

F0147-1-4-6

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

c. Equipment tag-out procedures

c. Reference COMSUBPACINST 5101.4 series  
(Bangor) or COMSUBLANTINST 5101.2 series  
(Kings Bay).

(1) Index/audit record

(1) Refer to SUBGEN Form 9890/31.

(2) Danger/caution tag-out record sheet

(2) Refer to NAVSEA Form 9210/9.

(3) Danger tag

(3) Refer to NAVSHIPS Form 9890/8.

(4) Caution tag

(4) Refer to NAVSHIPS Form 9890/5.

F0147-1-4-7

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(5) Out of calibration sticker

(5) Refer to NAVSHIPS Form 9890/6.

(6) Out of commission sticker

(6) Refer to NAVSHIPS Form 9890/7.

NOTE

Inform trainees that numerous preventive maintenance procedures for the ECS subsystems are identical (give an example). In these cases, only one procedure of each type will be discussed

3. Preventive maintenance procedures  
for the Support Subsystem

F0147-1-4-8



LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

a. EMI

a. Reference NAVEDTRA 172-17-00-84, pages 3-35 through 3-37.

b. Power Distribution Group

b. Refer to C-672 MRCs W-1, A-1, A-2, and 18M-1.

c. Teleprinter

c. Refer to W-2, M-2, and R-1Q.

4. Preventive maintenance procedures for the Antenna Suite

a. AS-2629B/BRR

a. Refer to C-458 MRCs Q-1, Q-2, Q-3, and R-1.

F0147-1-4-9

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP      A-111-4251 REV A  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

DISCUSSION POINT

b. AN/BRR-6

RELATED INSTRUCTOR ACTIVITY

b. Refer to C-674 MRCs Q-1, Q-2, A-1, and 24M-1.

NOTE

The following MRCs for the emergency antenna equipment are discussed only to show that they exist as part of the overall ECS preventive maintenance requirements.

c. AN/BRA-6

c. Refer to C-675 MRC A-2.

d. AT-774/UR

d. Refer to Q-1 and A-1.

F0147-1-4-10

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP      A-111-4251 REV A  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

e. AT-441/MRC

e. Refer to C-676 MRCs Q-1 and A-1.

f. OE-207/BR

f. Refer to C-677 MRCs M-1, A-1, and R-1.

4. Preventive maintenance procedures for the  
Control, Monitor, and Test (CMT) Subsystem

a. Communication Monitoring Control Console  
(A10)

a. Refer to C-668 MRCs W-2 and M-1.

b. Data Analysis-Programming Group (A15)

F0147-1-4-11

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- (1) Message Interface Unit (MIU)  
and Digital Interface Unit (DIU)

- (1) Refer to Q-17R and Q-18R.

NOTE

Inform trainees that test point locations are different on the MIU power supply than they are on the DIU power supply, but the procedures are identical.

- c. Recorder-Reproducer Group (A22)

- c. Refer to Q-3, Q-11R, and Q-12R.

NOTE

Inform trainees that MRCs Q-13R, Q-14R, Q-15R, Q-16R, S-11R, 18M-2, and 18M-3 are normally performed by TRIEFFAC personnel.

F0147-1-4-12

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

5. Preventive maintenance procedures for the  
Data Switching Subsystem (DSS)

a. Interconnecting Group (A5)

a. Refer to C-670 MRCs Q-1 and Q-3.

b. Interconnecting Group (A6)

b. Refer to Q-2.

6. Preventive maintenance procedures for the  
HF/UHF Subsystem

a. Receiver-Transmitter Group (A21)

a. Refer to C-673 MRCs W-2 and M-4.

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

b. Fixed Attenuators (A25 and A26)

b. Refer to MRCs M-3 and M-5.

NOTE

Inform trainees that MRC M-2 will be performed in lieu of M-5 if Field Change 10 is not installed.

7. Preventive maintenance procedures for the Emergency Communications Equipment

NOTE

The following MRCs for Emergency Communications Equipment are discussed only to show that they exist as part of the overall ECS preventive maintenance requirements.

F0147-1-4-14

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

a. AN/BRT-1 and AN/BRM-2

a. Refer to C-447 MRCs A-1R and A-2R.

b. Radio Transmitting Buoy T-616/SRT

b. Refer to C-531 MRCs W-1 and S-1R.

NOTE

Inform trainees that if MRC S-1R is to be performed by ship's force personnel, it must be done while the ship is sub-merged.

c. VHF-FM Hand Transceiver AN/PRC-94

c. Refer to C-796 MRCs R-1 and R-2.

8. Preventive maintenance procedures for the VLF/LF Subsystem

F0147-1-4-15

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

a. R-2109/BSC-1

a. Refer to W-2, step 2 and S-1.

9. Safety precautions

9. Refer to the Hazard Awareness Notice in the Trainee Guide. Reference OPNAVINST 5100 series.

a. Personnel

b. Equipment

(1) CMT Subsystem

(a) Message Interface Unit

F0147-1-4-16



LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT	RELATED INSTRUCTOR ACTIVITY
(b) Digital Interface Unit Interface	
(c) HSP/Magnetic Tape Unit Interface Unit	
(d) C-10447/BSC-1	
(e) RD-442/BSC-1	
(f) CM-507/BSC-1	
(2) DSS	

F0147-1-4-17

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(a) SA-2199/BSC-1, SA-2200/BSC-1,  
SA-2201/BSC-1 Switching Units

(b) CV-3510B/UG

(3) VLF/LF Subsystem

(a) R-2109/BSC-1

(b) R-2320/URR

(c) CP-1071B/WR

F0147-1-4-18

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(d) MD-1191/WRR-7B

(e) CY-8410/WRR-7B

(f) PP-8098/BSC-1

(4) HF/UHF Subsystem

(a) RT-1107(V)12/WSC-3(V)

(b) C-10975

F0147-1-4-19

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

(c) Command Center Telephone Terminal

(5) Support Subsystem

(a) TT-624/UG

(b) Power Distribution Group

(c) CMS 1022

(d) AN/BSC-1 Electronic Equipment Air Coolers

F0147-1-4-20

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

(6) Antenna Suite

(a) OE-207/BR

(b) AN/BRR-6

c. Tag-out procedures

RELATED INSTRUCTOR ACTIVITY

c. Reference OPNAVINST 3120.32 series, OPNAVINST 4790.4 series, CNTECHTRAINST 5100.5 series, COMSUBPACINST 5101.4 series (Bangor) or COMSUBLANTINST 5101.2 series (Kings Bay), and TTFBANGORINST 5100.4 series (Bangor) or TTFKINGSBAYINST 5100.5 series (Kings Bay).

LESSON PLAN

1. INTRODUCTION TO AND THEORY OF THE POWER DISTRIBUTION GROUP  
Topic 4. MAINTENANCE DESCRIPTION OF THE ECS

A-111-4251 REV A

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

10. Review and summary

12. Assignment

12. Make study assignments if required.

LESSON PLAN

A-111-4251 REV A

Section 2: BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS)

<u>Topic No.</u>	<u>Topic Title</u>	<u>Page</u>
1	Basic Operation and Operation of the DSS	F0147-2-1-1

# LESSON PLAN

2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) A-111-4251 REV A  
 Topic 1: Basic Operation and Operation of the DSS LAB PERIODS 3  
 CLASS PERIODS: 0.

## Topic Learning Objectives

Upon successful completion of this topic, the trainee will be able to:

1. Perform routine pre-operational, operational, and post-operational tasks for normal operation of the DSS and the following equipment.

- a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
- b. Signal Data Converter CV-3510B/UG
- c. TSEC/KG-84C
- d. TSEC/KG-36
- e. TSEC/KWR-46
- f. TSEC/KY-75
- g. TSEC/KY-58

2. Recognize and interpret all indications occurring during the performance of normal operating procedures, and perform appropriate operator actions in proper sequence on the DSS and the following equipment.

- a. TSEC/KG-84C
- b. TSEC/KG-36
- c. TSEC/KG-46
- d. TSEC/KY-75
- e. TSEC/KY-58

3. Recognize and interpret all indications occurring during the performance of all operating procedures, and perform appropriate operator actions in proper sequence on the DSS and the following equipment.

- a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
- b. Signal Data Converter CV-3510B/UG

F0147-2-1-1



# LESSON PLAN

A-111-4251 REV A

## 2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS)

Topic 1: Basic Operation and Operation of the DSS - Continued.

4. Perform tasks in the casualty/degraded/ab-normal modes of operation of the DSS and the following equipment.

- a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units

- b. Signal Data Converter CV-3510B/UG

5. Adhere to personnel and equipment safety precautions during normal operational procedures of the DSS and the following equipment.

- a. TSEC/KG-84C
- b. TSEC/KG-36
- c. TSEC/KG-46
- d. TSEC/KY-75
- e. TSEC/KY-58

6. Adhere to personnel and equipment safety precautions during all operational procedures of the DSS and the following equipment.

- a. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units

- b. Signal Data Converter CV-3510B/UG

### Trainee Preparation

#### A. Trainee Support Material:

1. Study Job Sheets F0147-2-1-1 through F0147-2-1-3.

#### B. Reference Publications:

1. Study EE109-AL-MMO-010/W153-DSS, tables 2-15 and 2-19.
2. Study KAO-83E/TSEC, sections 2007 and 3003a.
3. Study KAO-137E/TSEC, section 5102.
4. Study KAO-154B/TSEC, section 3002.
5. Study KAO-168B/TSEC, paragraph 3-2.
6. Study KAO-207A/TSEC, paragraph 3.10.d.
7. Study NAVSEA S9SSB-X9-SSM-84E/(U) 726V6P3B7E-2 (SSM V6P3B7E-2), AP 704-5.

F0147-2-1-2

# LESSON PLAN

2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) A-111-4251 REV A  
 Topic 1: Basic Operation and Operation of the DSS - Continued.

8. Study NAVSEA S9SSB-X9-SSM-84E/(U) 726V6P3B7E-3 (SSM V6P3B7E-3), ERP 701-9.
9. NAVSEA S9SSB-X9-SSM-84E/(U) 726V6P3B7E-2 (SSM V6P3B7E-2)
10. NAVSEA S9SSB-X9-SSM-84E/(U) 726V6P3B7E-3 (SSM V6P3B7E-3)
11. 8562110 AN/BSC-1 Instructor Utilization Handbook

## Instructor Preparation

### A. Review Assigned Trainee Material.

#### B. Reference Publications:

1. CNETINST 1500.20 series
2. EE109-AC-MMO-010/W153-BSC1-CMT
3. EE109-AL-MMO-010/W153-DSS
4. KAO-83E/TSEC
5. KAO-137E/TSEC
6. KAO-154B/TSEC
7. KAO-168B/TSEC
8. KAO-207A/TSEC

### C. Training Materials Required:

#### 1. Trainee Guide

#### 2. Publications:

- a. EE109-AL-MMO-010/W153-DSS
- b. KAO-83E/TSEC
- c. KAO-137E/TSEC
- d. KAO-154B/TSEC
- e. KAO-168B/TSEC
- f. NAVSEA S9SSB-X9-SSM-84E/(U) 726V6P3B7E-2 (SSM V6P3B7E-2)

F0147-2-1-3

LESSON PLAN

2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) A-111-4251 REV A  
Topic 1: Basic Operation and Operation of the DSS - Continued.

g. NAVSEA S9SSB-X9-SSM-84E/(U)  
726V6P3B7E-3 (SSM V6P3B7E-3)

h. 8562110 AN/BSC-1 Instructor  
Utilization Handbook

3. Equipment:

a. AN/BSC-1 Trainer

# LESSON PLAN

2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) A-111-4251 REV A  
 Topic 1. BASIC OPERATION AND OPERATION OF THE DSS

## DISCUSSION POINT

### Introduction

Notes: Provide trainees with lesson topic title and the objectives.

1. Safety precautions

## RELATED INSTRUCTOR ACTIVITY

1. Reference CNETINST 1500.20 series.

### a. Personnel

- a. Review Training Time Out procedures.

### b. Equipment

- b. Reference SSM V6P3B7E-1, PG 701; EE109-AL-MMO-010, paragraph 1-1; and EE109-AC-MMO-010, paragraph 1-1.

- (1) SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units

- (2) CV-3510B/UG

F0147-2-1-5

LESSON PLAN

2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) A-111-4251 REV A  
Topic 1. BASIC OPERATION AND OPERATION OF THE DSS

RELATED INSTRUCTOR ACTIVITY

DISCUSSION POINT

(3) TSEC/KG-84C

(4) TSEC/KG-36

(5) TSEC/KWR-46

(6) TSEC/KY-75

(7) TSEC/KY-58

2. Normal operation and indications

2. Prepare the AN/BSC-1 Trainer for use with Job Sheet F0147-2-1-1 using AN/BSC-1 IUH, section 3.

F0147-2-1-6

LESSON PLAN

2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) A-111-4251 REV A  
Topic 1. BASIC OPERATION AND OPERATION OF THE DSS

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- a. Direct the trainee to perform Job Sheet F0147-2-1-1. Verify that the trainee observes safety precautions and answers all questions correctly. Correct answers are provided on the Answer Sheet.
- b. Critique the job sheet to check for trainee understanding.
- c. Repeat Instructor Activity 1 and 2 through 2.b for remaining trainees.

Instructor Activity 1 is identified individually to emphasize the need to repeat it, because it pertains to safety.

3. Casualty/degraded operation and indications

3. Prepare the AN/BSC-1 Trainer for use with Job Sheets F0147-2-1-2 and F0147-2-1-3 using AN/BSC-11UH, section 3.

F0147-2-1-7

LESSON PLAN

2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) A-111-4251 REV A  
Topic 1. BASIC OPERATION AND OPERATION OF THE DSS

DISCUSSION POINT

- a. Configured circuit  
equipment failure

RELATED INSTRUCTOR ACTIVITY

- a. Direct trainee to perform Job Sheet F0147-2-1-2. Verify that the trainee observes safety precautions and answers all questions correctly. Correct answers are provided on the Answer Sheet.
- b. Critique the job sheet to check for trainee understanding.
- c. Repeat Instructor Activity 1 and 3 through 3.b for remaining trainees.
- d. Ensure that the trainer is returned to its original operating condition.

F0147-2-1-8

LESSON PLAN

2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) A-111-4251 REV A  
Topic 1. BASIC OPERATION AND OPERATION OF THE DSS

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

NOTE

With the trainee absent from the trainer set the BLACK DATA switch on A5A1 to OFF.

e. Black switch failure

e. Direct the trainee to perform Job Sheet F0147-2-1-3. Verify that the trainee observes safety precautions and answers all questions correctly. Correct answers are provided on the Answer Sheet.

f. Critique the job sheet to check for trainee understanding.

g. Repeat Instructor Activity 1 and 3.e and 3.f for remaining trainees.

F0147-2-1-9



LESSON PLAN

2. BASIC OPERATION AND OPERATION OF THE DATA SWITCHING SUBSYSTEM (DSS) A-111-4251 REV A  
Topic 1. BASIC OPERATION AND OPERATION OF THE DSS

DISCUSSION POINT

RELATED INSTRUCTOR ACTIVITY

- h. Ensure that the trainer is returned to its original operating condition.

4. Summary and Review

5. Assignment

- 5. Make study assignments if required.

**NAVEDTRA 131**  
**FEBRUARY 1993**

**TAB A-6**  
**TRAINEE GUIDE**

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

TRAINEE GUIDE

APRIL 1991

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Published by Direction of the Chief of Naval Technical Training

TRAINEE NAME PAGE

TRAINEE GUIDE

NAME \_\_\_\_\_

CLASS NUMBER \_\_\_\_\_

LIST OF EFFECTIVE PAGES

Page No.	Change in Effect	Page No.	Change in Effect
4	ORIGINAL		
5	ORIGINAL		
6	ORIGINAL		
7	ORIGINAL		
9	ORIGINAL		
11	ORIGINAL		
F0147-1-2-1	ORIGINAL		
F0147-1-3-1	ORIGINAL		
F0147-1-4-1	ORIGINAL		
F0147-1-5-1	ORIGINAL		

LETTER OF PROMULGATION



# SAFETY/HAZARD AWARENESS NOTICE

All personnel involved in operation or maintenance of electronic equipment must be thoroughly familiar with the electronic equipment safety precautions contained in Electronic Installation and Maintenance Book (SE000-00-EIM-100), section 3, and NSTM, Electronics, chapter 400, (S9086-ND-STM-000/ch. 400), section 2. In addition, attention is directed to the Accident Prevention Manual, OPNAVINST 5100.19 series, and Safety Policy and Procedures for Conducting Training, CNETINST 1500.20 series.

This equipment employs voltages which are dangerous and may be fatal if contacted by operating or maintenance personnel. Extreme caution must be exercised when working with this equipment. Hazard awareness dictates that this equipment must always be viewed as an integral part of a system and not as a component. While every practical precaution has been incorporated into this equipment, it is not possible or practical to try to list every condition or hazard that you may encounter. Therefore, all operating or maintenance personnel must at all times observe as a minimum, the following:

Don't service or adjust alone. Under no circumstances will a person operate or maintain equipment without the immediate presence or assistance of another person capable of rendering aid. Unless under direct supervision of a qualified person, no person shall operate or maintain equipment for which he is not qualified.

Don't tamper with interlocks. Reliance on interlock circuits to remove power from the equipment is never to be assumed. Until operation of the interlock is verified, equipment is assumed to be in the hazardous mode of operation. Under no circumstances will any access gate, door, or interlock switch be removed, bypassed or modified in any way by other than authorized maintenance personnel and then only after observing proper tag-out procedures.

Training Time Out. Any time a trainee or instructor has apprehension concerning his personal safety, or that of another, he shall verbally or physically signal "TRAINING TIME OUT" to stop the exercise and receive or provide additional instruction as appropriate in accordance with CNETINST 1500.20 series.

Report all hazards. If at any time you detect a hazard, it is your responsibility to report the hazard to ensure that it is corrected. If at any time you detect a "new" or "suspected new" hazard, particularly due to equipment installation, modification or repair, it is your responsibility to ensure that a SAFETYGRAM is submitted to the Naval Safety Center, Norfolk, VA, in accordance with OPNAVINST 5100.19 series. This will ensure that this hazard will be investigated, publicized, or corrected, as required.

The Pre-Mishap plan explains the procedures to follow and essential telephone numbers to call in case of an accident or emergency. It is located by the emergency exit in the laboratory.



SECURITY AWARENESS NOTICE

In the event that classified information is added to this Trainee Guide as a result of instructor personalization, the Trainee Guide shall be marked and handled in accordance with the regulations of the latest edition of the Department of the Navy Supplement to the DoD Information Security Program Regulation OPNAVINST 5510.1 series.

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All Instruction Sheets listed in this Table of Contents are not provided in this example Trainee Guide. Only one example of each Instruction Sheet type is provided.

## HOW TO USE YOUR TRAINEE GUIDE

### TRAINEE GUIDE

This publication is now in your custody and is for your use while learning theory of operation, adjustment, alignment, and maintenance of the Exterior Communications System (ECS) Eclectic System. **[Tailor to specific course.]**

You may not mark any pages in this book except for Job Sheets, Diagram Sheets, Problem Sheets, and the Trainee Name Page. **[Tailor to specific course.]**

Upon completion of this course of instruction return this Trainee Guide to your instructor.

### OTHER PUBLICATIONS

Reference publications contain most of the information needed for this equipment but were not prepared for training use.

This Trainee Guide was prepared to guide your training on this equipment and prepare you to use the equipment documentation in maintaining (or operating) the Exterior Communications System (ECS) Eclectic System.

Several other pertinent publications will be referred to frequently during the course.

### PRESENTATION OF COURSE MATERIAL

The course material on the Exterior Communications System (ECS) Eclectic System is divided into Sections and Topics, presented in a logical sequence. Operation, adjustment, alignment, troubleshooting, and efficient use of maintenance aids (documentation and test equipment) are stressed. **[Tailor to specific course.]** The knowledge and skills to be acquired are stated for each topic so that you can check your progress.

Assignments in publications are given for study. The effectiveness of this Trainee Guide depends upon the conscientious accomplishment of the reading and study assignments in the reference publications.

### WRITTEN AND PERFORMANCE TESTS

A testing program consisting of written and practical performance tests will be administered by the instructor.

## HOW TO USE YOUR TRAINEE GUIDE - Continued.

## SAFETY PRECAUTIONS

Voltages present in this and associated equipment are extremely dangerous. Read the Safety Precautions carefully and be aware of dangerous voltages when working on the equipment. Practice safety while learning about this equipment. Take time to be safe.

If you have any apprehension concerning your personal safety or that of another you shall verbally signal "Training Time Out" to the instructor to stop the exercise.

## SECURITY

In the event that classified information is added to this Trainee Guide as a result of trainee notes, the Trainee Guide shall be marked and handled in accordance with the regulations of the latest edition of the Department of the Navy Supplement to the DoD Information Security Program Regulation (OPNAVINST 5510.1 series).

# COURSE LEARNING OBJECTIVES

Upon successful completion of this course, the trainees will have acquired the following knowledge and skills and be able to:

## Knowledge:

1. Describe the theory necessary to support and understand the performance of normal and degraded operational tasks and all preventive maintenance without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the following:
  - a. TRIDENT Exterior Communications System (ECS)
  - b. Data Switching Subsystem (DSS)
  - c. Power Distribution Group
  - d. Towed Buoy Antenna AN/BRR-6
2. Describe the theory necessary to support and understand the performance of documented fault isolation and repair without going into detailed logic, circuit analysis, individual program flow diagrams, or detailed mechanical component breakdown of the following:
  - a. PP-7474/BSC-1, PP-7475/BSC-1 Power Supplies
  - b. SA-2199/BSC-1, SA-2200/BSC-1, and SA-2201/BSC-1 Switching Units
3. Describe the theory necessary to support undocumented fault isolation and repair requiring advanced analysis without going into signal or electrical flow, computer instructions, or detailed mechanical component breakdown except for those mechanical or logic elements or circuits unique to the equipment or program of the Interface Unit J-3565/BSC-1 (Message Interface Unit).

## Skills:

1. Perform normal and degraded operational procedures with supervision on the following:
  - a. TRIDENT Exterior Communications System (ECS)
  - b. Data Switching Subsystem (DSS)
  - c. Power Distribution Group
  - d. Towed Buoy Antenna AN/BRR-6
2. Perform preventive maintenance procedures with supervision on the following:
  - a. TRIDENT Exterior Communications System (ECS)
  - b. Data Switching Subsystem (DSS)

COURSE LEARNING OBJECTIVES - Continued

- c. Power Distribution Group
- d. Towed Buoy Antenna AN/BRR-6
- 3. Perform, with supervision, documented fault isolation and repair procedures to the authorized maintenance level on the following:
  - a. PP-7474/BSC-1, PP-7475/BSC-1 Power Supplies
  - b. SA-2199/BSC-1, SA-2200/BSC-1, SA-2201/BSC-1 Switching Units
- 4. Perform fault isolation and repair of faults that cannot be located using procedures contained in prescribed documentation or that require advanced analysis, with supervision, on the Interface Unit J-3565/BSC-1 (Message Interface Unit).

COURSE MASTER SCHEDULE

A-111-4251

Length of Period: 50 minutes

WEEK 1

DAY 1

TOPIC NO.	TYPE	PERIOD	TOPIC	RATIO
F0147.1.1	Class	1	General and Documentation description of the Power Distribution Group	25:1
F0147.1.2	Class	2	General, Physical, Functional, and Interface description of the AN/BRR-6	25:1
F0147.1.2	Class	3	Same	25:1
F0147.1.2	Class	4	Same	25:1

Only Part F0147, Sections 1 and 2 are used as examples in Volume II. The others are intentionally omitted.

WEEK 3

DAY 1

TOPIC NO.	TYPE	PERIOD	TOPIC	RATIO
F0147.1.10	Test	81	Power Distribution Group	25:1
F0147.2.1	Class	82	Basic Operation of the DSS	25:1
F0147.2.1	Lab	11	Same	10:1

ASSIGNMENT SHEET F0147-1-2-1

GENERAL, PHYSICAL, FUNCTIONAL, AND  
INTERFACE DESCRIPTION OF THE AN/BRR-6

INTRODUCTION

This lesson will show how the AN/BRR-6 operates and its effect on the system as a whole.

TOPIC LEARNING OBJECTIVES

Upon successful completion of this topic, you will be able to:

1. State the functions of the AN/BRR-6.
2. State that the AN/BRR-6 consists of the following major functional areas. Include the function of each to support normal operations.
  - a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)
  - b. Receiver Group OR-197/BRR-6
  - c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6
  - d. Buoy Cradle MT-4905/BRR-6
  - e. Reeling Machine RL-275/BRR-6
  - f. Sensor Group OA-8906/BRR-6
  - g. Buoy Door Sensing Switch
  - h. Buoy Control Indicator C-10256A/BRR-6
  - i. Antenna Control Indicator C-10257/BRR-6
  - j. Buoy Depth Control Indicator C-10258A/BRR-6
  - k. Relay Assembly RE-1115/BRR-6
  - l. Interconnecting Box J-3461/BRR-6
  - m. Towed Array Control Indicator Panel
3. Define the abbreviations and terms used with the AN/BRR-6 to support all operations and preventive maintenance.
4. State the operational characteristics and capabilities of the AN/BRR-6 to support all operations and preventive maintenance.
5. State the security requirements for the AN/BRR-6 to support all operations and preventive maintenance.

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FOR TRAINING USE ONLY



6. Describe all major and associated components of the AN/BRR-6 to support all operations and preventive maintenance. Include names, nomenclature, physical appearance, reference designators, locations, and construction features.
  - a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)
  - b. Receiver Group OR-197/BRR-6
  - c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6
  - d. Buoy Cradle MT-4905/BRR-6
  - e. Reeling Machine RL-275/BRR-6
  - f. Sensor Group OA-8906/BRR-6
  - g. Buoy Door Sensing Switch
  - h. Buoy Control Indicator C-10256A/BRR-6
  - i. Antenna Control Indicator C-10257/BRR-6
  - j. Buoy Depth Control Indicator C-10258A/BRR-6
  - k. Relay Assembly RE-1115/BRR-6
  - l. Interconnecting Box J-3461/BRR-6
  - m. Towed Array Control Indicator Panel
7. Describe the controls and indicators directly associated with the AN/BRR-6 to support all operations and preventive maintenance. Include names, reference designators, positions, conditions, colors, locations, and functions.
8. Describe how the AN/BRR-6 works (functional operation) to support all operations and preventive maintenance. Include signal flow, sequential operation, and indications.
  - a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)
  - b. Receiver Group OR-197/BRR-6
  - c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6
  - d. Buoy Cradle MT-4905/BRR-6
  - e. Reeling Machine RL-275/BRR-6
  - f. Sensor Group OA-8906/BRR-6

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FOR TRAINING USE ONLY

- g. Buoy Door Sensing Switch
  - h. Buoy Control Indicator C-10256A/BRR-6
  - i. Antenna Control Indicator C-10257/BRR-6
  - j. Buoy Depth Control Indicator C-10258A/BRR-6
  - k. Relay Assembly RE-1115/BRR-6
  - l. Interconnecting Box J-3461/BRR-6
  - m. Towed Array Control Indicator Panel
9. Describe the functional interface between the AN/BRR-6 and related external equipments to support all operations and preventive maintenance.
- a. Power sources
  - b. Input signals
  - c. Output signals

#### STUDY ASSIGNMENT

1. Study EE125-FA-MMF-010/E110-BRR-6, FOMM Technical Manual Support Volume for Radio Receiving Set AN/BRR-6, Volume 1, glossary; tables 1-1 and 2-1 through 2-7; paragraphs 1-1, 1-2, 1-2.1 through 1-2.12, and 1-3 through 1-6; and figures 2-1 through 2-8, 5-1, and 5-3.
2. Study NAVSEA S9SSB-X9-SSM-900/(U)726V6P3B13 (SSM V76P3B13), Habitability, Ship Handling, and Emergency Systems Operating Instructions, OI 637-11, paragraph 1-1.

#### STUDY QUESTIONS

1. How many units comprise the BRR-6?
2. What is the frequency range of the BRR-6?
3. What is the maximum speed allowable for towing the buoys?
4. What is the maximum speed for launching a buoy?
5. Is it good practice to stream the buoyant cable and fly a buoy at the same time?

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FOR TRAINING USE ONLY

6. How many buoys are associated with each BRR-6?
7. What is the minimum depth for launching a buoy?
8. How much cable does each cable have?
9. What does FOMM mean?
10. Which units of the BRR-6 are located in the IRR?
11. Which units of the BRR-6 are located in the Command and Control Center?
12. How many antennas are associated with the Towed Buoy?
13. What is the purpose of the Depth and Destruct Canister?  
Where is it located?
14. Which unit controls all the buoy electronics?
15. How close to the surface must the buoy be before Unit 10 can take over depth control?
16. How does Unit 9 (Towed Buoy Antenna Control Unit) communicate with the buoy electronics?
17. Where are the tow cable cutters located?
18. Where does the BRR-6 receive its 115 vac 60 Hz power from?
19. Do the navigation center signals go through the AIS cabinet in the IRR?

---

FOR TRAINING USE ONLY

OUTLINE SHEET F0147-1-2-1

GENERAL, PHYSICAL, FUNCTIONAL, AND  
INTERFACE DESCRIPTION OF THE AN/BRR-6

INTRODUCTION

This lesson will show how the AN/BRR-6 operates and its effect on the system as a whole.

TOPIC OUTLINE

1. Security requirements
2. Functions of the AN/BRR-6
3. Abbreviations and terms
4. Major functional areas/major and associated components
5. Functional operation
6. Functional interface
7. Operational characteristics and capabilities

<p>NOTE TO READER: This Outline Sheet was developed to leave room for the student to take notes.</p>
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FOR TRAINING USE ONLY

INFORMATION SHEET F0147-1-3-1

SAFETY POLICY FOR CONDUCTING TRAINING

A. INTRODUCTION

1. This information sheet is designed to provide you with an understanding of Navy policy regarding training safety.
2. This information sheet covers "Training Time Out" procedures that are to be used during the conduct of this course.

B. REFERENCES

1. CNETINST 1500.20 series, Safety Procedures for Conducting Training in Arduous or Potentially High Risk Activities

C. INFORMATION

1. The mission of the Navy dictates the need for an aggressive training program to prepare personnel to perform professionally and competently in many high risk activities under diverse and possible adverse conditions. Potentially high risk training includes, but is not limited to, training requiring exposure to potentially hazardous conditions involving the environment (water entry, temperature extremes), atmosphere (fire fighting, use of solvents), explosives (weapons), electrical mechanical or hydraulic training devices or equipments.
2. It is the policy of the Chief of Naval Education and Training (CNET) to provide required training under controlled conditions, within practical and realistic limits, to obtain desired training outcomes while maintaining the maximum margin of safety. Included in this policy is the requirement that in the event a trainee is apprehensive of his personal safety while undergoing training, that concern shall be addressed.

D. TRAINING TIME OUT (TTO)

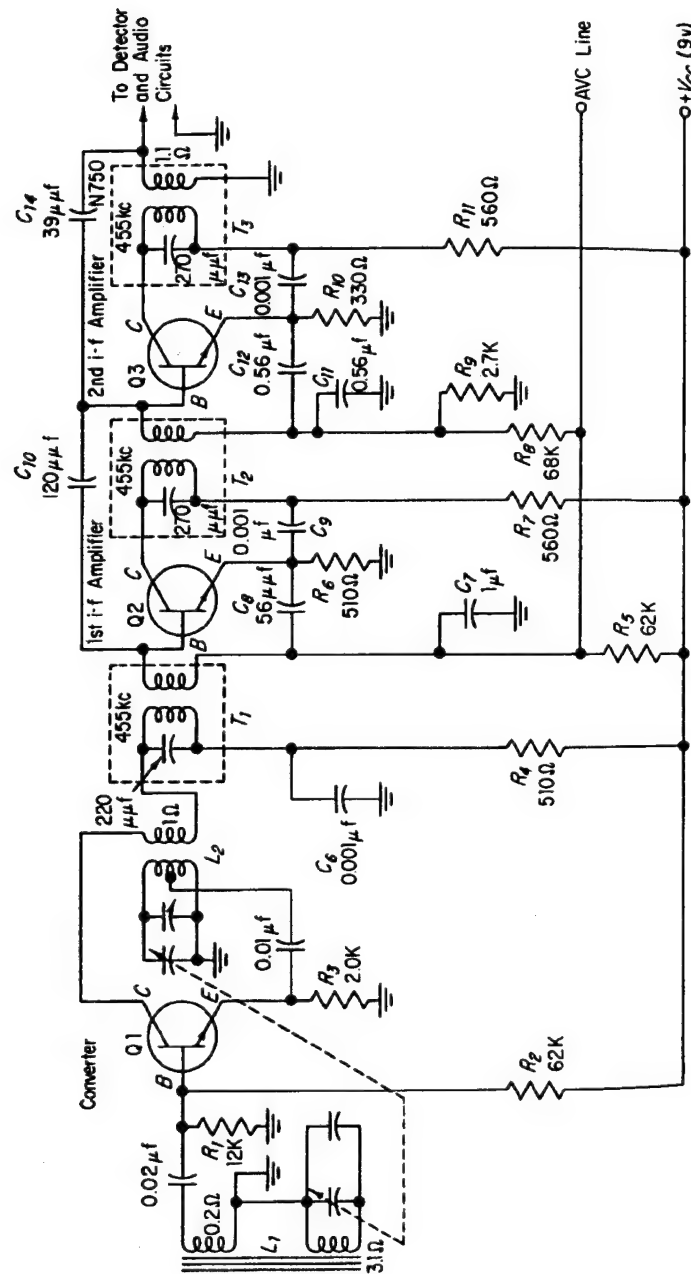
1. Any time a trainee or Instructor has apprehension concerning his personal safety or that of another, he shall verbally signal "TRAINING TIME OUT" to stop the exercise and receive or provide additional instruction as appropriate in accordance with CNETINST 1500.20 series.

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FOR TRAINING USE ONLY

DIAGRAM SHEET

F0147-1-4-1



FOR TRAINING USE ONLY

JOB SHEET F0147-5-1-1

POWER SUPPLIES PP-7474/BSC-1 AND PP-7475/BSC-1  
ADJUSTMENT PROCEDURES

A. INTRODUCTION

1. This job sheet will aid you in becoming proficient in performing adjustments on the Power Supply PP-7474/BSC-1 to support documented corrective maintenance.
2. You will be evaluated on your observance of safety precautions during performance of this job sheet. In addition, strict adherence to documented procedures will be closely monitored.

B. EQUIPMENT

1. AN/BSC-1 Trainer
2. Test Equipment
  - a. Digital Multimeter, Fluke Model 8600A-01, SCIN/SCAT 4212
3. Tools
  - a. Flat-tip screwdriver, 8-inch, 5/16-inch tip, LCA 1613
  - b. Offset screwdriver, NSN 5120-00-287-2130
  - c. Open end wrench, 1/2-inch, 4-inch, LCA 2516
  - d. Phillips screwdriver, No. 2, 8-inch, LCA 2838

C. REFERENCES

1. EE109-AL-MMO-010/W153-DSS, Data Switching Subsystem Operation and Maintenance Instructions, Volume 1

NOTE: The adjustment procedures for the Power Supply PP-7474/BSC-1 are identical to the adjustment procedures for the Power Supply PP-7475/BSC-1.

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FOR TRAINING USE ONLY

D. JOB STEPS

Step 1. Perform the power supply voltage checks as described in paragraphs 6-2.a through 6-2.a(4) and table 6-2. Record your readings in the spaces provided. Inform the instructor of any out of tolerance readings.

PS1: \_\_\_\_\_ PS2: \_\_\_\_\_ PS3: \_\_\_\_\_

INSTRUCTOR CHECK \_\_\_\_\_  
SAT

Step 2. Perform the power supply voltage adjustments as described in paragraphs 6-2.a(5) through 6-2.a(12) to correct the power supply(s) which are not within the specified tolerances.

INSTRUCTOR CHECK \_\_\_\_\_  
SAT

Step 3. Return the equipment to its original operating condition.

INSTRUCTOR CHECK \_\_\_\_\_  
SAT

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FOR TRAINING USE ONLY



PROBLEM SHEET F0147-5-1-1

A. INTRODUCTION

This Problem Sheet will help you become proficient at troubleshooting the Power Supply PP-7474/BSC-1 using the authorized technical documentation.

B. REFERENCES

1. EE109-AL-MMO-010\W153-DSS, Data Switching Subsystem Operation and Maintenance Instructions, Volume I.

C. PROBLEM

Using the authorized technical documentation, list in logical order the troubleshooting steps required to isolate the problem.

D. GIVEN

Each PP-7474/BSC-1 Power Supply malfunction can be identified and isolated using the authorized technical documentation.

E. INITIAL CONDITIONS

An operator of the Data Switching Subsystem reports that the system will power up but will not remain online.

F. REQUIRED RESPONSES

1. Locate the symptom index

---

2. Locate the symptom

---

3. Where are the recommended tests and inspections located?

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4. Locate the "Troubleshooting and Diagnosing" chapter.

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5. Once the problem has been identified, the technical documentation and the steps required to correct the problem.

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FOR TRAINING USE ONLY

**NAVEDTRA 131**  
**FEBRUARY 1993**

**TAB A-7**  
**TEST PACKAGE**

TESTING PLAN  
FOR  
TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)  
MODEL CURRICULA

A-111-4251 REV A

PREPARED BY  
TRIDENT TRAINING FACILITY, BANGOR  
SILVERDALE, WA 98315-5400

PREPARED FOR  
CHIEF OF NAVAL TECHNICAL TRAINING  
NAVAL AIR STATION MEMPHIS  
MILLINGTON, TENNESSEE 38054

01 MAY 1990

## TESTING PLAN FOR:

### A-111-4251 REV A TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS) MODEL CURRICULA

#### TESTS AND METHODS

The purpose of this Testing Plan is to establish procedures which will be used in evaluating the student's performance on attaining the objectives of the course. Performance for the A-111-4251 REV A course is measured by the following:

1. Knowledge Progress Test
2. Performance Test
3. Practical Work

Tests are as follows:

Knowledge Progress Test - A knowledge test with a minimum of 30 questions is administered at the end of Section 1, Topic 4. The following TLO's must be tested: 1-1-2, 1-1-4, 1-2-2, 1-2-4, 1-2-6, 1-2-8, 1-3-2, 1-3-4, 1-3-5, 1-4-2, and 1-4-3. Additional TLO's may be selected for testing to make up a test with a minimum of 30 questions.

Performance Test - A skill test is administered at the end of Section 2, Topic 1 utilizing Job Sheet F0147-2-1-1 and Administrator Guide (minimum score of 70% is required).

Performance Test - A skill test is administered at the end of Section 3, Topic 1 utilizing Job Sheet F0147-3-1-1 and Administrator Guide (minimum score of 70% is required).

Knowledge Progress Test - A knowledge tests with a minimum of 30 questions is administered at the end of Section 4, Topic 5. The following TLO's must be tested: 4-1-2, 4-2-1, 4-2-3, 4-3-2, 4-3-3, 4-3-4, 4-3-5, 4-4-2, 4-5-3, 4-5-4, 4-4-5, 4-4-6, and 4-5-8. Additional TLO's may be selected for testing to make up a test with a minimum of 30 questions.

Performance Test - A skill test is administered at the end of Section 5, Topic 1 utilizing Job Sheet F0147-5-1-1 and Administrator Guide (minimum score of 70% is required).

Knowledge Progress Test - A knowledge tests with a minimum of 30 questions is administered at the end of Section 6, Topic 3. The following TLO's must be tested: 6-1-2, 6-2-2, 6-3-2, 6-3-3, 6-3-4, 6-3-5, and 6-3-7. Additional TLO's may be selected for testing to make up a test with a minimum of 30 questions.

Performance Test - A skill test is administered at the end of Section 7, Topic 1 utilizing Job Sheet F0147-7-1-1 and Administrator Guide (minimum score of 70% is required).

### TESTING CONSTRAINTS

There are no constraints which prevent achievement of all course objectives.

### PERFORMANCE TEST PROCEDURES AND NUMERICAL GRADE

Performance tests are administered individually. Performance tests are given to evaluate the student's overall skills taught in the course. The instructor/evaluator uses checklists and rating scales to evaluate the student. The standard for the performance tests is 70%. All critical steps must be performed without error. Students will be allowed one retake. Prior to the retake, the instructor will provide specific feedback to the student as to his or her performance on the failed test to allow the student to correct any problems. Additional practice may be required of the student prior to retaking the test. Students who are not able to meet the standard after the retest will be recommended for an Academic Review Board. Performance tests will be critiqued.

### MINIMUM PASSING GRADE

All tests are criterion-referenced in that they measure the students' actual knowledge or performance against criteria derived from learning objectives. The minimum grade for the A-111-4251 REV A course is 70%, based on evaluation of the learning objectives and determination that the minimum passing grade needs to be at or above the point of average understanding.

### WEIGHTING CRITERIA FOR COMPUTING FINAL COURSE GRADES

Comprehensive Tests	30% X (Student's Grades)	= _____
Performance Tests	60% X (Student's Grades)	= _____
Practical Work	10% X (Student's Grades)	= _____

Total = Final Course Grade

### KNOWLEDGE PROGRESS TEST PROCEDURES

Knowledge Progress tests are administered to the entire class. Results of the tests are used to evaluate the student's progress in the course. The minimum passing grade is 70%.

### PRACTICAL WORK GRADES

Practical work grades for the course consist of graded homework and assignment sheets. The practical work grades will be averaged and will count as a percentage of the final grades as indicated on the Weighting Criteria area of this testing plan. If problem areas occur during practical work they will be remediated during class.

### REMEDIATION

A student who scores at or above the minimum passing score will be immediately remediated in class to their specific problem areas. A student who scores below the minimum passing score will be subject to instructor oral remediation and night study. In addition the student will be retested as soon as possible. Students will be allowed one retake. Students who fail the retake will be recommended for an Academic Review Board.

Test to Objective to PPP Line Item Comparison

Part	Section	Lesson Topic	Objective	PPP Number	Test	Number	Version
F0147	1	4.1.4	1	1-6-1a	5020	12	1
F0147	1	4.1.4	2	1-6-3	5020	45	1
F0147	1	4.1.4	3	1-6-11	6112	10	3
F0147	3	4.1.1	1	2-2-2	5020	30	1
F0147	3	4.1.1	2	2-2-11	6112	15	3

# TEST SCHEDULE

<u>Period</u>	<u>Test Number</u>
40	5020
55	6112
80	7103



TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

A-111-4251

KNOWLEDGE TEST ADMINISTRATORS GUIDE

KNOWLEDGE TEST NO. 121A

OPERATIONAL DESCRIPTION OF THE DSS

August 1991

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FOR OFFICIAL USE ONLY

A-7-11

**KNOWLEDGE TEST ADMINISTRATOR'S GUIDE**  
**TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)**

A-111-4251

**I. Instructions To Administrator**

**A. Prior to the start of testing:**

1. Cover or Remove all training materials that could assist the students in answering test items.
2. Inform students that they have 50 minutes for the test.
3. Provide pencils and scratch paper as necessary.
4. Read the test instructions to the students.
5. Provide pertinent reference documentation.
6. Honor local instruction pertinent to testing as applicable.

**B. After completing the test:**

1. Collect and inventory all testing material.
2. Check test for marks made by students.
3. Review test with students.
4. Evaluate any test challenged by students.
5. Apply local instructions as necessary.

**II. EVALUATION INSTRUMENT      N/A**

**III. GRADING CRITERIA**

Using the individual grading key subtract 2 points for each missed question.

**IV. INSTRUCTIONS TO THE TRAINEE**

- A. This is a completion or short answer test.
- B. On the answer sheet print your name and social security number.
- C. Anyone caught cheating fails and is subject to disciplinary action.
- D. The time to take this test is 50 minutes.
- E. This test completes Your Knowledge Course Learning Objective X.X.X.

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

A-111-4251

KNOWLEDGE TEST ADMINISTRATORS GUIDE

KNOWLEDGE TEST NO. 121A

OPERATIONAL DESCRIPTION OF THE DSS

August 1991

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A-7-15

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM

C1

SECTION/TOPIC 1.1  
Date: Oct 1991

TEST #11111  
Revised \_\_\_\_\_

1. The function of the Power Distribution Group is to \_\_\_\_\_.
2. List the major functional areas of the Power Distribution Group.
  - a.
  - b.
  - c.
  - d.
  - e.
3. The function of the AN/BRR-6 is to \_\_\_\_\_.
4. List the function of each of the following to support normal operation of the AN/BRR-6.
  - a. Towed Buoy TB-17/BRR-6 (Bangor) or Towed Buoy TB-18A/BRR-6 (Kings Bay)
  - b. Receiver Group OR-197/BRR-6
  - c. Special Purpose Electrical Cable Assembly CX-13053/BRR-6
  - d. Buoy Cradle MT-4905/BRR-6
  - e. Reeling Machine RL-275/BRR-6
  - f. Sensor Group OA-8906/BRR-6
  - g. Buoy Door Sensing Switch
  - h. Buoy Control Indicator C-10256A/BRR-6
  - i. Antenna Control Indicator C-10257/BRR-6
  - j. Buoy Depth Control Indicator C-10258A/BRR-6
  - k. Relay Assembly RE-1115/BRR-6
  - l. Interconnecting Box J-3461/BRR-6
  - m. Towed Array Control Indicator Panel

Questions 5 - 49 omitted for this example

50. Describe preventive maintenance procedures for the following
  - a. Control, Monitor, and Test (CMT) Subsystem
    - (1) Interface Unit J-3565/BSC-1 (Message Interface Unit)

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM

C1

SECTION/TOPIC 1.1  
Date: Oct 1991

TEST #11111  
Revised \_\_\_\_\_

- (2) Interface Unit J-3566/BSC-1 (Digital Interface Unit Interface)
- (3) Interface Unit J-3568/BSC-1 (HSP/Magnetic Tape Unit Interface Unit)
- (4) Recorder-Reproducer Control C-10447/BSC-1
- (5) Recorder-Reproducer Unit RD-442/BSC-1
- (6) Comparator CM-507/BSC-1
- b. Data Switching Subsystem (DSS)
  - (1) SA-2199/BSC-1, SA-2200/BSC-1, and SA-2201/BSC-1 Switching Units
  - (2) Signal Data Converter CV-3510B/UG
- c. Very Low Frequency/Low Frequency (VLF/LF) Subsystem
  - (1) Radio Receiver R-2109/BSC-1
  - (2) Radio Receiver R-2320/URR
  - (3) Digital Data Processor CP-1071B/WR
  - (4) Digital Data Demodulator MD-1191/WRR-7B
  - (5) Electrical Equipment Enclosure CY-8410/WRR-7B
  - (6) Power Supply PP-8098/BSC-1
- d. High Frequency/Ultra High Frequency (HF/UHF) Subsystem
  - (1) Radio Receiver-Transmitter RT-1107(V)12/WSC-3(V)
  - (2) Voice Switch Unit Control C-10975
  - (3) Command Center Telephone Terminal
- e. Support Subsystem
  - (1) Teleprinter TT-624/UG
  - (2) Power Distribution Group
  - (3) Audio Tape Recorder CMS 1022
  - (4) AN/BSC-1 Electronic Equipment Air Coolers subsystems and equipment

TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)

A-111-4251

PERFORMANCE TEST ADMINISTRATORS GUIDE

PERFORMANCE TEST NO. 121A

OPERATIONAL DESCRIPTION OF THE DSS

AUGUST 1991

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FOR OFFICIAL USE ONLY

**PERFORMANCE TEST ADMINISTRATOR'S GUIDE**  
**TRIDENT EXTERIOR COMMUNICATIONS SYSTEM (ECS)**

A-111-4251

**I. Instructions To Administrator**

**A. Prior to the start of testing:**

1. This job sheet will aid you in becoming proficient in performing adjustments on the Power Supply PP-7474/BSC-1 to support documented corrective maintenance.
2. You will be evaluated on your observance of safety precautions during performance of this job sheet. In addition, strict adherence to documented procedures will be closely monitored.
3. Inform students that they have 50 minutes for the test.
4. Provide pencils and scratch paper as necessary.
5. Provide pertinent reference documentation
6. Honor local instruction pertinent to testing as applicable.

**EQUIPMENT**

1. AN/BSC-1 Trainer
  2. Test Equipment
    - a. Digital Multimeter, Fluke Model 8600A-01, SCIN/SCAT 4212
  3. Tools
    - a. Flat-tip screwdriver, 8-inch, 5/16-inch tip, LCA 1613
    - b. Offset screwdriver, NSN 5120-00-287-2130
    - c. Open end wrench, 1/2-inch, 4-inch, LCA 2516
    - d. Phillips screwdriver, No. 2, 8-inch, LCA 2838
- B. After completing the test:**
1. Collect and inventory all tools.
  2. Shut down all power supplies.
  3. Review test with students.

4. Evaluate any test area challenged by students.

5. Apply local instructions as necessary.

## II. Evaluation Instrument

A. Job sheet No. 4-5-1-1

B. Steps: There are 2 steps to be evaluated. They are the PSE checks and the PSE adjustments.

C. Description of errors: The most common error made by the trainee is reading multimeter wrong.

## III. Grading Criteria

A. Step 1=checklist evaluation as satisfactory/unsatisfactory on the reading.

B. Step 2=Rating scale based on time, accuracy(+/-5%), safety, use of equipment, and procedures.

## IV. Instructions to the Trainee

1. Remember TTO Procedures. There is a 50-minute time limit.

2. This job sheet will aid you in becoming proficient in performing adjustments on the Power Supply PP-7474/BSC-1 to support documented corrective maintenance.

3. You will be evaluated on your observance of safety precautions during performance of this job sheet. In addition, strict adherence to documented procedures will be closely monitored.



**Performance Record Sheet**

Name: \_\_\_\_\_

SSN: \_\_\_\_\_

Class No: \_\_\_\_\_

Start Time: \_\_\_\_\_

Stop Time: \_\_\_\_\_

Score: \_\_\_\_\_

JOB SHEET F0147-5-1-1

POWER SUPPLIES PP-7474/BSC-1 AND PP-7475/BSC-1  
ADJUSTMENT PROCEDURES

A. INTRODUCTION

1. This job sheet will aid you in becoming proficient in performing adjustments on the Power Supply PP-7474/BSC-1 to support documented corrective maintenance.
2. You will be evaluated on your observance of safety precautions during performance of this job sheet. In addition, strict adherence to documented procedures will be closely monitored.

B. EQUIPMENT

1. AN/BSC-1 Trainer
2. Test Equipment
  - a. Digital Multimeter, Fluke Model 8600A-01, SCIN/SCAT 4212
3. Tools
  - a. Flat-tip screwdriver, 8-inch, 5/16-inch tip, LCA 1613
  - b. Offset screwdriver, NSN 5120-00-287-2130
  - c. Open end wrench, 1/2-inch, 4-inch, LCA 2516
  - d. Phillips screwdriver, No. 2, 8-inch, LCA 2838

C. REFERENCES

1. EE109-AL-MMO-010/W153-DSS, Data Switching Subsystem Operation and Maintenance Instructions, Volume 1

NOTE

The adjustment procedures for the Power Supply PP-7474/BSC-1 are identical to the adjustment procedures for the Power Supply PP-7475/BSC-1.

FOR TRAINING USE ONLY

## D. JOB STEPS

Step 1. Perform the power supply voltage checks as described in paragraphs 6-2.a through 6-2.a(4) and table 6-2. Record your readings in the spaces provided. Inform the instructor of any out of tolerance readings.

PS1: \_\_\_\_\_ PS2: \_\_\_\_\_ PS3: \_\_\_\_\_

Note: Instructor mark sat/unsat.

INSTRUCTOR CHECK \_\_\_\_\_  
SAT

Step 2. Perform the power supply voltage adjustments as described in paragraphs 6-2.a(5) through 6-2.a(12) to correct the power supply(s) which are not within the specified tolerances.

Use a 10 point rating scale:

- a. Procedures \_\_\_\_\_
- b. Safety \_\_\_\_\_
- c. Accuracy \_\_\_\_\_
- d. Use of equipment \_\_\_\_\_

INSTRUCTOR CHECK \_\_\_\_\_  
SAT

Step 3. Return the equipment to its original operating condition.

INSTRUCTOR CHECK \_\_\_\_\_  
SAT

FOR TRAINING USE ONLY

**TAB A-8**

**PILOT COURSE MONITORING REPORT**

## **PILOT COURSE MONITORING REPORT**

**LOCATION:** TRITRAFAC BANGOR

**TITLE:** Trident Exterior  
Communications  
System

**PERIOD OF REPORT:** 17 Mar - 22 May 91    **CIN:** A-111-4251

**MONITORS/REPRESENTING:** ETCS Trueman (Pilot Team Chairman)  
TRITRAFAC, BANGOR ETC Upton  
(Course Monitor) TRITRAFAC,  
BANGOR

### **I. ADMINISTRATION**

#### **A. Facilities**

1. The present facility at TRITRAFAC, BANGOR is large enough to accommodate 24 trainees. However, since the equipment utilized for the follow-on course can only accommodate 12 students, it is recommended that the Exterior Communications System class size be held to a maximum of 12 trainees.

#### **B. Safety**

1. TTO and specific safety hazards were called out before each laboratory.

#### **C. Security**

1. Not applicable as this course is unclassified.

#### **D. Allocation**

1. This course can be taught in 10 weeks, as planned, with a total of 400 contact hours.

#### **E. Critique Sheets (Summary of student comments)**

1. Overall, student comments were favorable regarding the course content and the instructors.

2. Students felt the skills and knowledge acquired from the course would be directly applied on the job.
3. A number of students felt the course should have been a week longer in order to slow the pace down and provide more time for studying before the tests.

## II. CURRICULUM VALIDATION

### A. Instructor Guide

1. This command scheduled a pilot and taught this course from 28 January to 10 April 1991. However, shortly into the pilot, the course monitors and LT Duncan, Chief of Naval Technical Training, all agreed that the lesson materials should be revised and a second course pilot conducted.
2. The following changes were made to the lesson materials prior to the repilot:
  - a. The revised Training Level Assignment (TLA) dated 4 December 1991 was utilized vice the TLA dated 8 November 1990.
  - b. More information supporting each of the main headings was included in the Instructor Guide. The informational bullets were included to assist the instructors in personalizing their Instructor Guide and in teaching the course.
  - c. Topics were resequenced for better teachability and flow.
  - d. The Resource Requirements list was revised to accurately reflect required training materials.
  - e. PPP line items from Logistics Leadership and Management Table B061 were not included in the Instructor Guide. These items will be taught in General Military Training (GMT).

## B. Trainee Guide

1. The Trainee Guide was revised to correspond with the Instructor Guide and study questions on the reading assignments were included. The instructors reviewed the assigned study questions at the start of each day.
2. Due to the short turnaround time, the Trainee Guide used in the pilot was a cut-and-paste revision of the previous Trainee Guide.
3. It was decided that the trainees should write in the Trainee Guide and take it with them to their next command. While this will result in higher printing costs, it was determined that the revised Trainee Guide contains a considerable amount of valuable information that the students could use at their next command.

## C. Equipment/Tools

1. All equipment and tools were adequate except the AN/ASM-4D Multimeter input impedances too low and gives inaccurate readings. Digital Voltmeter replacement will be required.

## D. Instructional Media Materials

1. All transparencies will be screened for readability at 20 feet from the screen.

## E. Instruction

1. The instructors were prepared to teach all of the lessons and the lessons were well presented, which kept the interest level high throughout the course.

F. Testing

1. Only one version of the test series was completed in time for the pilot. The course testing officer has been tasked to develop alternate test series for the course.

III. INSTRUCTIONAL ACCURACY/ADEQUACY

- A. Not applicable

IV. MINORITY REPORTS

- A. None

V. OTHER

- A. As the Monitoring Team Chairman, I recommend that this course be revised as is indicated by the red-lined Lesson Plan. I recommend that all subsequently scheduled classes be taught using the red-lined Lesson Plan until smooth copies are promulgated.